MUNICIPALITY OF SINGAPORE

HEALTH DEPARTMENT

A N N U A L R E P O R T

F O R

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HEALTH DEPARTMENT,
Singapore, 16th March, 1948.

The President,
Municipal Commissioners,
SINGAPORE.

Sir,

I have the honour to submit my report on the working of the Health Department during the year 1947.

When reading this report it should be remembered that the figures and rates quoted are uncorrected unless otherwise stated. Now, as in the past no effective means are available for making adjustments for "outward" and "inward" transfers of deaths etc. in the Singapore Municipal Area, or for that matter elsewhere in Malaya.

Owing to the geographical position of the Town of Singapore, the orphanage, home for the aged, hospitals and other institutional and medical facilities within it, serve not only the Municipal Area, but also the Port of Singapore, passengers in transit to and from the Port, the remaining portion of Singapore Island, the adjoining islands and indeed, to a considerable extent, a large portion of the Malay Peninsula.

It has been proved time and again by investigations which have been made that these institutions etc. exert an unfavourable influence on our death and infectious diseases etc. figures and rates.

When comparing the crude figures and rates in this report with those of other cities the abnormal age and sex distribution of our population must, also, be borne in mind.

The full Report on the Census taken in September has not been published at the time of writing. The only census figures as yet available are provisional totals by race and sex. These are given later on in the section dealing with statistics.

I. NOTIFIABLE DISEASES & OTHER INFECTIOUS AND PARASITIC DISEASES.

4,102 cases (690 excluding Tuberculosis) of Infectious Disease in persons ordinarily resident within the Municipal Area were notified during the year against 3,958 cases (709 excluding Tuberculosis) in 1946 and 4,524 cases (1,162 excluding Tuberculosis) in 1941.

I. NOTIFIABLE DISEASES.

The following table shows the comparison between this year and the previous ten years (excluding the years of Japanese occupation).

Only cases of persons stated to be ordinarily resident in the Municipal area are shown in this Table.

YEAR	Typhoid Fever	Para-typhoid Fever	Diph-theria	Chicken-pox	Puerperal Fever	Erysi-pelas	Cerebro Spinal Fever	Small-pox	Plague	Cholera	*1 Typhus Fever	Scarlet Fever	TOTAL	*2 Anthrax	*3 Leprosy	*4 Tuberculosis	*5 Poliomye-litis	Total Notifica-tions.
1933	248	7	244	288	11	5	4	-	1	-	1	-	809	-	-	970	-	1779
1934	116	4	254	412	6	5	7	1	-	-	3	2	810	-	-	960	-	1770
1935	415	9	193	529	16	5	11	52	-	-	18	-	1248	-	-	1053	-	2301
1936	455	6	176	833	22	9	16	-	-	-	15	-	1532	-	-	1246	-	2778
1937	222	5	217	709	16	6	17	-	-	-	8	-	1200	1	32	-	-	1233
1938	736	4	262	659	31	11	24	1	-	-	10	-	1738	-	62	-	-	1800
1939	186	3	328	787	19	2	20	1	-	-	17	1	1364	-	71	-	-	1435
1940	124	5	330	820	30	8	18	-	-	-	19	4	1358	-	46	1881	-	3285
1941	273	9	331	329	34	16	20	-	-	-	9	1	1022	-	138	3362	1	4523
1942/45						(Japanese Occupation Period not included)												
1946	87	6	121	183	26	5	7	87	-	-	10	1	533	-	50	3249	126	3958
Average for 10 years	286.2	5.8	245.6	554.9	21.1	7.2	14.4	14.2	.1	-	11.0	.9	1161.4	-	-	-	-	2486.2
1947	70	1	131	317	20	3	16	42	-	-	8(a)	-	-	-	81	3412	1	4102

(a) Out of 8 cases - 6 Flea Borne 2 Mite Borne.

*1 Under the heading of Typhus are included Tsutsugamushi or Scrub Typhus of Malaya (mite borne) and flea borne, Urban type Tropical Typhus. Louse borne Typhus has not been seen in Singapore.

*2) *3) First made notifiable in 1937.

*4 Tuberculosis was not notifiable January, 1937 - March, 1940.

*5 Acute Poliomyelitis was made a notifiable Infectious Disease November 1st 1941 (Gazette Notification 263/1.11.41).

NOTIFIABLE DISEASES BY RACES 1947.

The following table shows the incidence by races of ALL Notifiable Infectious cases notified within the Municipal Area during the year.

Disease	Europeans	Eurasians	Chinese	Malays	Indians	Others	Total
Typhoid Fever	5	4	70	6	9	-	94
Paratyphoid Fever	3	-	1	-	1	-	5
Diphtheria	7	7	145	2	7	2	170
Chickenpox	5	21	176	19	161	5	387
Puerperal Fever	-	-	16	8	3	-	27
Poliomyelitis	1	-	-	1	2	-	4
Cerebro-Spinal Fever	-	-	24	3	1	-	28
Tuberculosis	11	48	3135	213	334	14	3755
Small-pox	1	2	23	17	4	-	47
Leprosy	-	-	82	2	8	-	92
Typhus Fever	1	-	6	-	7	-	14
Cholera	-	-	-	-	-	-	-
Erysipelas	1	-	3	1	-	-	5
Scarlet Fever	-	-	-	-	-	-	-
T O T A L.	35	82	3681	272	537	21	4628

IMPORTED CASES OF NOTIFIABLE DISEASES BY RACES 1947.

The following table shows cases of Notifiable Infectious Diseases by Races notified during the year within the Municipal Area in persons whose address as shown, or on information gathered from other sources, were known not to ordinarily reside within the Municipal Area (i.e."imported cases" by land, sea, or air).

Disease	Europeans	Eurasians	Chinese	Malays	Indians	Others	Total
Typhoid Fever	4	1	13	2	4	-	24
Paratyphoid Fever	3	-	1	-	-	-	4
Diphtheria	2	5	30	-	2	-	39
Chicken-pox	1	3	15	5	46	-	70
Puerperal Fever	-	-	5	-	2	-	7
Poliomyelitis	1	-	-	1	1	-	3
Cerebro Spinal Fever	-	-	12	-	-	-	12
Tuberculosis	3	2	278	12	47	1	343
Small-pox	1	2	-	2	-	-	5
Leprosy	-	-	11	-	-	-	11
Typhus Fever	1	-	4	-	1	-	6 +
Erysipelas	1	-	1	-	-	-	2
Cholera	-	-	-	-	-	-	-
T O T A L	17	13	370	22	103	1	526

+ Out of 6, 1 Flea Borne
4 Mite Borne
1 Unspecified.

The following return shows by months ALL cases of Notifiable Infectious Diseases notified within the Municipal Area during the year. The figures in brackets are "imported cases" from outside the Municipal Area.

Diseases	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL.
Typhoid Fever	1	6	14 (2)	3 (6)	6 (1)	7 (3)	6 (1)	3 (4)	3 (1)	9 (2)	4 (2)	8 (2)	70 (24)
Paratyphoid Fever	- (1)	-	-	-	-	- (1)	-	- (1)	-	- (1)	1	-	1 (4)
Diphtheria	14 (5)	12 (1)	8 (2)	9	10 (4)	4 (3)	8 (2)	7 (8)	16 (2)	15 (2)	9 (3)	19 (7)	131 (39)
Chicken-pox	21 (3)	14 (3)	20 (6)	22 (3)	10 (2)	20 (5)	11 (3)	12 (2)	17 (9)	38 (8)	50 (9)	82 (17)	317 (70)
Puerperal Fever	1 (1)	-	-	4 (2)	3	2	2	1	2 (3)	1	1	3 (1)	20 (7)
Poliomyelitis	- (1)	- (1)	-	-	-	-	- (1)	-	-	-	-	1	1 (3)
Cerebro Spinal Fever	- (3)	-	1	- (3)	6 (4)	1	1 (1)	-	1	2 (1)	4	-	16 (12)
Tuberculosis	238 (24)	269 (18)	294 (24)	275 (25)	283 (33)	337 (28)	295 (31)	254 (40)	295 (31)	259 (20)	310 (33)	303 (36)	3412 (343)
Small-pox	24 (2)	16 (2)	2 (1)	-	-	-	-	-	-	-	-	-	42 (5)
Leprosy	3 (1)	8	5	8	6 (1)	8	7 (2)	10	4	8	5 (5)	9 (2)	81 (11)
Typhus Fever	-	1 (2)	- (1)	-	-	1	2	-	2 (1)	- (1)	1 (1)	1	8 (6)
Erysipelas	- (1)	-	1	- (1)	-	-	1	-	-	-	-	1	3 (2)
Cholera	-	-	-	-	-	-	-	-	-	-	-	-	-
Scarlet Fever	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL.	302 (42)	326 (27)	345 (36)	321 (40)	324 (45)	380 (40)	333 (41)	287 (55)	340 (47)	332 (35)	385 (53)	427 (65)	4102 (526)
Total Imported and Municipal cases.	344	353	381	361	369	420	374	342	387	367	438	492	4628

SMALLPOX, PLAGUE AND CHOLERA.

The following table shows the number of Smallpox cases treated and/or found and notified in the Municipal Area during 1947 and 1946.

	Municipal Residents	Imported Cases	Total
1946	87	18	105
1947	42	5	47

42 cases (5 found dead) of Smallpox in Municipal residents and 5 imported cases (one brought in dead) were notified during the first quarter of the year. No further cases were seen or notified during the remainder of the year.

In 1947 and 1946 the public were advised to have themselves vaccinated or re-vaccinated. Repeated publicity was given through the medium of the press, radio and the Public Relations Department's broadcasting vans etc. We are indebted to the officers concerned for their ready co-operation.

The temporary Vaccinators employed in 1946 were retained until 30th August, 1947, when practically no further persons were presenting themselves for vaccination. In 1947 - 166,259 primary vaccinations and re-vaccinations were done. In all 275,017 vaccinations were done within the two year period 1946 - 1947.

PLAGUE.

No case of Plague was reported during the year.

CHOLERA.

No case of Cholera was reported during the year.

TYPHOID AND PARATYPHOID.

71 cases (1 Paratyphoid) were notified in Municipal residents. 28 imported cases (4 Paratyphoid) were treated in the Municipal Infectious Disease Hospital. 22 deaths were certified as due to Typhoid and Paratyphoid during the year, compared with 32 in 1946 and 102 in 1941.

During the year we carried out an examination of all employees working in the Ice Cream factories which are licensed to sell to hawkers as well as to the public - No Typhoid carriers were detected. These examinations were done regularly in prewar days.

ACUTE POLIOMYELITIS.

4 cases were notified - of these 3 were imported from outside the Municipal Area. No deaths were certified as due to this disease.

TUBERCULOSIS.

3,755 cases (3,412 in Municipal residents) were notified during the year as against 3,593 (3,249 in Municipal residents) in 1946 and 3,362 in Municipal residents in 1941. Whereas the actual number of cases of Tuberculosis notified in Municipal residents in 1947 was slightly higher than in 1946 (163 more cases) or 1941 (50 more cases) the number of deaths certified as due to Tuberculosis (all forms) in 1947 (i.e. 1,586 deaths) was considerably lower than in 1946 (2,103 deaths) or in 1941 (1,928 deaths). The death rates from this disease (all forms) based on the census population figures in 1931, 1936 and 1947 (provisional figures) are 1931 - 3.089 per mille, 1936 - 2.809 and 1947 - 2.35 per mille.

TUBERCULOSIS (CONTINUED).

It is generally recognised that notification of cases of Tuberculosis must necessarily be incomplete. In Singapore until comparatively recently, the standard of notification of this, ~~(and other notifiable infectious)~~ diseases must have been very poor judging by the smaller number of cases notified than deaths certified as due to this disease.

For the reason mentioned in the last paragraph it would be fallacious to attempt to make any inference as to the prevalence of Tuberculosis in Singapore today as compared with say 1931 by making a comparison of the notification rates for this disease in 1947 and in years gone by (e.g.) the notification rate in 1947 was 4.7 per 1,000 of population (provisional). The corresponding rates in 1931 and 1936 were 2.118 and 2.542.

The notifications of Tuberculosis (all forms) in 1947 are shown by sexes and age groups in the following table:-

NOTIFICATIONS OF TUBERCULOSIS (ALL TYPES) 1947 (MUNICIPAL RESIDENTS ONLY).

	AGE GROUPS							
	0-5	5-10	10-15	15-20	20-45	Over 45	Age not Stated	Total
MALES	80	22	15	93	1696	600	14	2520
FEMALES	75	21	16	60	540	177	3	892
TOTAL.	155	43	31	153	2236	777	17	3412

The number of cases notified in each age group except "over 45" are slightly higher in 1947 than in 1946. As in 1946, the vast majority of the cases notified were in the age groups 20-45 and "over 45" (i.e.) in the wage-earning age groups.

DIPHTHERIA.

131 cases were notified in Municipal residents, 39 imported cases were notified and treated in the Municipal Infectious Disease Hospital. 25 deaths were certified as due to this disease.

CEREBRO SPINAL FEVER.

28 cases were notified (including 12 imported cases) as against 11 cases in 1946 and 20 cases in 1941.

OTHER INFECTIOUS AND PARASITIC DISEASES.

Deaths certified during the year as due to some of the non-notifiable infectious and parasitic diseases are given in the table which follows:- The 1946 figures are given for comparison.

	1947	1946
Dysentery Bacillary	14	19
Unspecified	54	111
Amoebic	19	13
Influenza	169	207
Measles	1	24
Whooping Cough	5	6
Encephalitis Lethargica	1	2
Leptospirosis (Weil's Disease)	4	1

OTHER INFECTIOUS AND PARASITIC DISEASES (CONTD.)

103 cases of Measles and Rubella (cf. 211 in 1946), 12 of Whooping Cough (cf. 34 in 1946) were treated in Middleton Hospital during the year.

89 cases of Amoebic Dysentery, 5 Bacillary Dysentery and 6 Clinical Dysentery (cf. 95, 15 and 48 respectively in 1946) underwent treatment at Middleton Hospital during the year.

GENERAL.

1. MEDICAL INSPECTION OF PASSENGERS.

The Malayan Union and Singapore Port Authorities issued 345 permits to passengers to enter Singapore. These embraced 587 passengers of whom 69 failed to report.

2. HOUSES QUARANTINED AND DISINFECTED.

29 Houses were quarantined and 581 were disinfected.

3. INFECTIOUS PERSONS AND CONTACTS.

375 patients were removed to Middleton Hospital including 41 cases of Small-pox and 47 Small-pox contacts. 327 Small-pox contacts were sent to St. Johns Island. 5 bodies of Small-pox cases were removed to the Middleton Hospital mortuary.

20 bodies were buried under supervision.

The bodies of two persons suspected of having died from Infectious Diseases were taken to Middleton Hospital for post mortem.

77 Lepers were removed to the Leper Camp.

II. MIDDLETON HOSPITAL.

The full report of the Medical Superintendent is appended.

VACCINATION.

38,636 children under 5 years of age were vaccinated by Municipal Vaccinators and 10,474 by Private Practitioners (i.e.) 49,110 under 5. In addition 117,149 persons over 5 years of age were vaccinated or revaccinated.

VITAL STATISTICS.

A Pan Malayan Census was taken on the night of September 20th, 1947. The Census Report has not been published to date but provisional figures for our population by race and sex have been published by the Superintendent of Census.

The provisional figures for the Municipal Area are shown in the following table:-

RACE	MALES	FEMALES	TOTAL
Europeans	3,590	2,766	6,356
Eurasians	3,598	3,859	7,457
Chinese	285,167	250,404	535,571
Malays	39,893	33,293	73,186
Indians	38,421	13,206	51,627
Others	3,134	2,622	5,756
TOTAL.	373,803	306,150	679,953

VITAL STATISTICS (CONTINUED)

These figures exclude the following classes of persons:

(a) transients afloat and

(b) service personnel other than locally enlisted personnel enumerated in camps and similar establishments.

The provisional figure for the population in the Municipal Area in 1947 is 189,798 higher than that obtained at the Municipal Census in 1936. Adding to the 1936 census figure the excess of births over deaths in the Municipal Area from 1936 to 1947, (including the Japanese occupation period) a figure of 571,336 is obtained. This figure is 108,617 less than that obtained at the census. This "surplus" of 108,000 can only have been due to an excess of immigration over emigration since the date of the last census in 1936.

For purposes of the rates in this report the mid-year population for 1947 was estimated by deducting the excess of births over deaths for each race for the third quarter of the year from the figures obtained at the Census. The mid-year population so estimated is shown in the table which follows:-

MID-YEAR POPULATION BY RACES AND SEXES BASED ON PROVISIONAL CENSUS FIGURES.

RACES	MALES	FEMALES	TOTAL
Europeans	3,571	2,731	6,302
Eurasians	3,565	3,834	7,399
Chinese	283,163	248,268	531,431
Malays	39,688	33,066	72,754
Indians	38,218	12,966	51,184
Others	3,125	2,598	5,723
TOTAL	371,330	303,463	674,793

In intercensal years since 1936 our mid-year population was estimated by means of the formula devised by Mr. Vlieland. This is referred to in some detail in previous reports.

The figures obtained at the Census indicate that our population estimated by this method, at least in 1946, was too low and therefore the rates based on this estimate in 1946 were probably too high.

The provisional census figures for our population in 1947 do not include "transients afloat" or "service personnel other than locally enlisted personnel enumerated in camps and similar establishments". To make the census figures published for previous census years comparable with the 1947 figures I have as far as is possible adjusted them to exclude service personnel and transients afloat which were included in previous census figures, and, where necessary to exclude the population in Pulau Brani and Blakan Mati which were included in the Municipal figures for 1891 and to include wayfarers, prisoners in the gaol and the population on the rivers which were excluded in some previous census figures. The figures for the "Island" have also been adjusted to exclude the population on the adjoining islands. These adjustments explain why the figures published in the table below do not agree with the census figures published for the previous census years.

	Europeans		Eurasians		Chinese		Malays		Indians		Others		TOTAL			Municipal Area.
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	Total	
Municipality 1947 Island.	3,590	2,766	3,598	3,859	285,167	250,404	39,893	33,293	38,421	13,206	3,134	2,622	373,803	306,150	679,953 922,634	31.87 sq. miles
Municipality 1936 Island	4,460	2,878	3,491	3,660	220,331	153,786	24,387	20,690	38,104	9,298	4,528	3,542	295,301 (Census not taken of Island).	193,854	489,155	31.73 sq. miles
Municipality 1931 Island	3,119	2,373	2,929	3,205	214,618	125,996	23,481	19,892	34,871	6,485	4,442	3,282	283,460	161,233	444,693 556,719	29 sq. miles
Municipality 1921 Island	2,432	1,757	2,232	2,388	185,763	87,630	18,872	15,233	23,381	4,396	3,211	2,079	235,891	113,483	349,374 417,377	29 sq. miles
Municipality 1911 Island	2,461	1,385	2,137	2,290	141,928	52,088	15,088	12,912	20,158	4,336	1,808	1,884	183,580	74,895	258,475 290,343	29 sq. miles
Municipality 1901 Island	1,675	1,075	1,972	2,055	119,715	31,045	15,558	11,588	13,145	3,345	1,243	1,379	153,308	50,487	203,795 222,703	29 sq. miles
Municipality 1891 Island	1,408	845	1,715	1,734	90,571	20,017	15,259	10,590	12,334	3,007	940	804	122,489	37,003	159,492 177,538	29 sq. miles

These figures show that the Municipal population in 1947 was over 4½ times as large as that in 1891 (i.e.) in a period of 56 years.

In the past and even for the period 1936 - 1947 the increase in our population has been mainly due to a surplus of immigration over emigration. In 1891 there were only 230 Chinese females to 1,000 males, in 1947 there were 876. This marked alteration which has occurred and is still occurring in the Chinese male to female ratios (78.77% of our population are Chinese) must necessarily affect the rate of natural increase of our population.

Prior to 1928 there was no natural increase in the population. In 1928 the excess of births over deaths was 2,956, in 1947 it was 20,900.

This rapidly rising rate of natural increase of the population may accelerate the rate of increase of our population in years to come.

The population of the town and island of Singapore has increased by a reasonably near approach to a regular geometrical progression from 1891 to 1947, even though, within this period two major wars, occupation by an enemy, several slumps and booms and marked alterations in the sex ratio of the population etc. have occurred.

In one of the old Municipal reports it was predicted about 1901 that the Municipal population had probably reached its maximum. After the 1911 or 1921 census the same opinion was again expressed. When will the maximum population be reached in the Municipality or on the Island, and what will the rate of increase be till then?

In order to obtain some figure or figures which might with advantage be borne in mind when planning for the future, in Singapore town and the Island, estimates have been worked out for the population in say 20 and 50 years' time (a) working on the assumption that the population will continue to increase for the next 50 years at more or less similar progressively rising rates to those shown over the period 1891 - 1947; and (b) working on the assumption, illogical though it may appear to be that approximately the same mean annual increase of the population that was shown between 1931 and 1947 will continue for the next 20 - 50 years. These figures are as follows:-

YEAR	Working on Assumption (a)		Working on Assumption (b)	
	Island	Municipal Area	Island	Municipal Area
1969	1,656,000	1,141,000	1,380,000	973,900
2001	4,473,000	2,716,000	2,157,000	1,473,800

Sex distribution of Races.

The proportion of females to 1,000 males in various census years is shown in the table which follows:- In this table it may be noted that whereas there were only 221 Chinese females to 1,000 males in 1891 this figure has risen to 878 in 1947.

FEMALES PER 1,000 MALES.

	1891	1901	1911	1921	1931	1936	1947
Europeans	600	642	421	515	572	527	770
Eurasians	1011	1066	1071	1070	1094	1048	1073
Chinese	221	279	367	472	587	698	878
Malays	693	790	855	807	847	848	835
Indians	243	271	215	188	186	244	343
Others	855	1112	1042	647	739	782	837
All Races		353	406	479	567	654	

The percentage of the various races in our population in 1891 and 1947 are shown in the following table - service personnel and their families are excluded:-

Year.	European	Eurasian	Chinese	Malay	Indian	Other Races
1891	1.41	2.16	69.34	16.21	9.62	1.10
1947	.93	1.10	78.77	10.76	7.59	0.85

BIRTHS.

The number of births reported during the year was 30,548 compared with 26,859 in 1946 and 24,939 in 1941.

The crude birth rate for all races combined was 45.27.

The ratio of males to 1,000 female births registered was for the Chinese 1,079; the Malays 1,030; the Indians 985.

The following is the number of births for each month of the year, the 1946 figures being, also, shown.

Month	1946	1947	Month	1946	1947
January	1703	2849	July	2391	2455
February	1424	2216	August	2463	2453
March	1563	2482	September	2559	2775
April	1853	2343	October	3048	2693
May	2045	2495	November	2957	2480
June	2027	2361	December	2826	2946
TOTAL.	10615	14746		16254	15802

A perusal of the table shows that whereas the births registered in the first half of 1947 exceed those registered in the corresponding period of 1946 by about 4,000, those registered in the latter half are about 400 less than in the corresponding period of 1946.

The births registered by races were:-

	1946			1947		
	Males	Females	Total	Males	Females	Total
Europeans	40	31	71	109	122	231
Eurasians	133	142	275	179	153	332
Chinese	11439	10426	21865	12584	11663	24247
Malays	1436	1221	2657	1640	1593	3233
Indians	931	902	1833	1153	1170	2323
Others	82	76	158	80	102	182
TOTAL	14061	12798	26859	15745	14803	30548

The following table shows the birth rate for each race in 1947, 1936 and 1931, all of which were census years:-

	1931	1936	1947
Europeans	26.43	22.43	36.66
Eurasians	33.10	25.45	44.87
Chinese	38.84	45.69	45.63
Malays	40.48	40.86	44.44
Indians	21.91	27.72	45.39
Others	29.03	32.22	31.80
All Races Combined	36.99	42.59	45.27

DEATHS.

With possibly a very few exceptions deaths in service personnel or their families are not included in these returns.

The total number of deaths for the year was 9,648 against 11,556 in 1946 and 12,853 in 1941 and the crude death rate 14.30 per 1,000 living compared with 24.23 in 1936 and 25.20 in 1931. 1936 and 1931 were also census years.

The excess of births over deaths was 20,900 against 15,303 in 1946, 9,001 in 1936 and 5,255 in 1931.

The following return shows the number of deaths and the death rate for each month of the year:-

Month	Deaths	Rate	Month	Deaths	Rate
January	907	15.84	July	805	14.06
February	769	14.87	August	796	13.90
March	767	13.39	September	922	16.63
April	790	14.25	October	802	14.00
May	853	14.89	November	686	12.38
June	846	15.26	December	705	12.31

The death rates for the different races in 1947 and in 1931 and 1936 are shown in the following table:-

	1931 (Census Year)			1936 (Census Year)			1947 (Census Year)		
	M	F	Both Sexes	M	F	Both Sexes	M	F	Both Sexes
Europeans	6.93	5.84	6.53	6.41	4.17	5.64	10.64	3.66	7.62
Eurasians	20.49	12.65	16.38	12.60	11.72	12.17	10.10	10.69	10.41
Chinese	27.38	25.56	26.78	26.88	24.77	26.01	15.84	12.28	14.17
Malays	26.74	26.12	26.48	24.97	25.23	25.09	17.16	15.54	16.43
Indians	14.27	34.45	17.49	14.12	24.31	16.12	12.69	18.82	14.24
Others	16.17	14.27	15.34	16.78	11.29	14.37	13.12	10.01	11.71
All Races Combined	25.18	25.24	25.19	24.28	24.00	24.23	15.53	12.80	14.30

It is to be noted that the rates in 1947 for all races, except Europeans, are lower than the corresponding rates shown in 1936 or 1931. This decline in the rates is most marked in the case of Chinese and Malays.

The following return gives the number of deaths for each cause of disease by race, age and sex. The classification follows that of the 1931 Manual of the International List of Causes of Deaths as adopted for use in England and Wales.

Not published

The following return shows the total number of deaths at different age periods in the different races:-

Nationality	Sex	Under 28 days	28 days to 3 mths	3 to 12 mths	1 to 2 years	2 to 3 years	3 to 4 years	4 to 5 years	5 to 10 years	10 to 15 years	15 to 20 years	20 to 25 years	25 to 35 years	35 to 45 years	45 to 55 years	55 Over	Unknown	TOTAL	
Europeans	M	7										3	3	4	7	14		38)	48
	F	3	1	1										3	1	1		10)	
Eurasians	M	5	5	2					1		2	2	4	4	5	6		36)	77
	F	5	5	6	2					1	2	1	5	2	4	8		41)	
Chinese	M	502	235	475	208	99	71	44	118	68	76	139	331	575	705	836	2	4484)	7532
	F	428	226	398	179	73	79	51	92	47	48	69	234	283	261	580		3048)	
Malays	M	93	77	113	24	11	10	4	14	11	11	38	73	71	62	69		681)	1195
	F	56	45	82	30	12	10	11	18	10	24	18	42	51	37	68		514)	
Indians	M	47	19	24	5	10	3	1	6	3	10	20	85	99	78	75		485)	729
	F	48	12	40	8	5	5	1	13	7	13	14	28	16	17	17		244)	
Others	M	4	2	5							1	3	8	5	3	5	5	41)	67
	F	8		1	1							1	3	3	1	8		26)	
TOTAL	M	658	338	619	237	120	84	49	139	82	100	205	504	758	860	1005	7	5765)	9648
TOTAL	F	548	289	528	220	90	94	63	123	65	87	103	312	358	321	682		3883)	
GRAND TOTAL		1206	627	1147	457	210	178	112	262	147	187	308	816	1116	1181	1687	7		

The number of deaths in every age group, with two exceptions, is lower than in the corresponding age group in 1946 or 1941. The exceptions are (a) age group 10-15 in 1941 where 5 less deaths are shown than in 1947 and (b) in age group 0-1 in 1946 where 401 less deaths are shown than in 1947. The greater number of deaths in the latter age group is understandable as there were over 4,000 more births in 1947 than in 1946.

The number of deaths shown in the various age groups in 1947 are lower than those shown in the corresponding age groups in 1931 or 1936 (both census years) except in the age group 55 and over and age group 10-20 in 1931 where a few less deaths are shown than in 1947. Considering that the population and number of infant births registered in 1947 were much higher than in 1931 or 1936 the smaller number of deaths shown in most of the age groups in 1947 than in 1931 or 1936, is remarkable.

GENERAL DEATH RATE.

As has already been pointed out, the rates given in this report are based on census figures (provisional) obtained during the year. The figures obtained at the census show that the method employed to estimate our population in intercensal years gave us an under-estimate of the population and therefore the rates based on the population as estimated in 1945 and 1946 and other intercensal years are probably too high.

The crude death rate for the year was 14.30 per 1,000 living compared with 24.23 in 1936 and 25.20 in 1931. 1936 and 1931 were also census years.

The chief causes of death in 1941 and 1946 and the rates per 1,000 living in 1947 are set out in the table which follows. The 1931 and 1936 figures are given for comparison in the table beneath.

TABLE I.

	1941 cases	1946 cases	1947	
			cases	rate per mille
Bronchitis and Pneumonias	1,835	1,806	1,488	2.205
Tuberculosis	1,928	2,103	1,586	2.350
Infantile Convulsions (up to 5 years)	839	611	729	1.080
Beri Beri	630	700	383	.568
Diarrhoea and Enteritis	1,114	698	811	1.202
Diseases of early infancy	790	851	832	1.233
Nephritis	405	373	244	.362
Malaria	270	578	255	.378
Old Age	433	382	353	.523
Cancer	331	225	245	.363
Violence	344	654	478	.708
Influenza	266	207	169	.250
Heart Disease	182	318	304	.451
Dysenteries	357	143	87	.129
Typhoid	102	31	22	.033
Diphtheria	67	22	25	.037

It will be seen from a perusal of this table that the actual number of deaths from the various diseases were lower in most cases in 1947 than in 1941 or 1946.

TABLE II.

	1931		1936	
	Cases	Rate per mille	Cases	Rate per mille
Bronchitis and Pneumonias	1,881	4.22	1,990	4.060
Tuberculosis	1,377	3.09	1,406	2.869
Infantile Convulsions (up to 5 years)	1,193	2.68	1,056	2.154
Beri Beri	651	1.46	767	1.565
Diarrhoea and Enteritis	782	1.75	912	1.861
Diseases of early infancy	658	1.48	707	1.442
Nephritis	448	1.01	546	1.114
Malaria	551	1.24	525	1.071
Old Age	447	1.00	376	.77
Cancer	193	.43	235	.48
Violence	285	.64	246	.50
Influenza	149	.33	132	.27
Heart Disease	292	.66	433	.88
Dysenteries	432	.97	241	.492
Typhoid	86	.19	157	.32
Diphtheria	24	.54	63	.13

It will be noted from a perusal of the above table and the previous table that the death rates and actual number of deaths from the various diseases were lower in most cases in 1947 than in 1936 or 1931.

The deaths from Pneumonias and other respiratory infections and Tuberculosis (97% of which were of the Respiratory type) accounted for 31.8% of all the deaths certified during the year.

The death rate in 1947 was the lowest ever recorded for Singapore. This may but does not necessarily mean that the general health of the population was better in 1947 than ever before. An improvement in the general health of the population is not the only thing that can cause a reduction in the death rate.

As we do know that the general sanitary conditions in the town were worse than in prewar days, improved sanitary conditions as a possible cause of the lowering of the rate can definitely be ruled out. Other factors which can and undoubtedly did play a part in the lowering of the rate are:-

(a) Alterations in the age distribution of the population. The census figures for the age distribution of the population have not been published to date. Any alteration in the age distribution is important as death rates are lowest in the middle age periods of life and highest at the two extremes. A comparison of the percentage of the total deaths shown in the various age groups in 1947 as compared with 1941 suggests, that alterations in the age distribution of our population may have occurred especially in the age group 1 - 5. This is understandable in view of the low birth and high infantile mortality rate during the occupation.

(b) Alteration in the sex distribution of the population. The provisional census figures show that the proportion of females to males has gone up since 1936. This would tend to lower the death rate as females as a whole have a lower death rate than males.

(c) Diminution in the adverse effects on our death rate caused by non-residents dying in hospitals etc. in the town. The bigger our staple population becomes the less adverse effect will these deaths have on our death rate provided they do not go up in number at the same rate as our population.

(d) A decline in the case mortality rate in certain Pneumonias and other diseases due to the use of Penicillin since the occupation and other new drugs since about 1939 undoubtedly lowered the death rate from Pneumonia and certain other diseases.

(e) The general decline in the incidence of the debilitating disease malaria which appears to have occurred throughout Malaya may have had its effect in our death rate.

(f) Possibly the greater bulk of our population eat better balanced diets today than in prewar days. Some evidence to this effect has been evinced at the Ante Natal and Infant Welfare Clinics etc.

(g) Possibly climatic conditions may have been particularly favourable from a health point of view, throughout the greater part of the year.

Reduction in overcrowding in the town was certainly not in any way responsible for the decline in the death rate, as the position with regard to overcrowding is today worse than ever before.

In the table which follows the census population of the Municipal area in 1901 (corrected as mentioned in the section on statistics) and in 1947 (provisional figure) and the number of "buildings" shown in the Municipal Assessors returns for these years are shown.

Year	Population	Buildings assessed by Municipal Assessor	Persons per Building	Houses enumerated at Census.
1901	203,795	20,870	9.7	23,047
1947	679,953	38,437	17.9	not yet published

In the Municipal Assessor's returns "buildings" include godowns, stores, offices, banks, cinemas, garages etc. as well as dwelling houses. No unauthorised structures are included in these returns. 2,177 more buildings were enumerated at the census in 1891 than were shown on the Assessor's returns for that year. Presumably they were all unauthorised plank and attap etc. erections.

In Municipal reports prior to 1901 Health Officers commented on the overcrowding in the houses in those days. It will be interesting to see how many buildings including unauthorised erections are shown in the 1947 census returns.

For purposes of comparison with the Singapore population and housing figures, some figures taken from a recent article in the "Medical Officer" on a housing survey in Birmingham are of interest ".....The population of Birmingham is a little over a million, housed in 283,611 houses shared by 299,144 families ..... To achieve decent accommodation about 45,000 entirely new houses are required....." Comment is superfluous.

As a census was taken in 1931, 1936 and 1947 our populations for these years are known and therefore a comparison of the death rates for our two principal causes of death for these years is of interest. The Tuberculosis (all forms, 97% were respiratory) death rates were as follows:-

1931	-	308.9	deaths per 100,000 of the population.
1936	-	286.9	" " " " " "
1947	-	235	" " " " " "

A comparison of these figures shows that less deaths were certified as due to Tuberculosis per 100,000 of the population in 1947 than in 1936 or 1931.

The actual number of deaths certified as due to Tuberculosis in 1947 was considerably less than in any year between 1938 and 1941 or in 1946. The number of cases of Tuberculosis notified in 1947 was only 50 morethan in 1941. 113 less cases were notified in 1946 than in 1941.

As the population was probably considerably smaller in 1941 than in 1946 or 1947 the slight increase (50) in the number of cases notified in 1947 as compared with 1941, is not out of the way.

These figures do not lend support to the view so frequently expressed that the Tuberculosis position in Singapore since the reoccupation is much worse than in prewar days. On the contrary, they would appear to suggest that the converse was the case.

The death rates from Bronchitis, the Pneumonias and other respiratory infections in 1947, 1936 and 1931 are shown in the table which follows:

1931	-	422	per 100,000
1936	-	406	" "
1947	-	220.5	" "

The actual number of deaths certified as due to Bronchitis and Pneumonias and other respiratory infections in 1947 was considerably lower than in 1946 or in any year between 1939 and 1941 and very markedly lower than in the years prior to 1939. The very marked decline in the death rate shown for this group of diseases in 1947 as against 1931 or 1936 is to a very large extent explicable by the new methods of treatment by drugs which have come into vogue since 1938 which have undoubtedly reduced the mortality rate in certain Pneumonias etc.

Some of the factors, previously mentioned, which were probably responsible for the marked decline in the general death rate probably also played their part in the causation of the lower death rates from Tuberculosis and the other respiratory diseases for the year under review, as compared with prewar years.

In 1947, the Pneumonias and other non tubercular respiratory infections accounted for 15.4% of our total deaths (c.f. 8.4% in England and Wales in 1939) and Tuberculosis (all forms) accounted for 16.4% (c.f. 5.2% in England and Wales in 1939).

Some of the "high" and "low" Tuberculosis mortality rates shown in the United Nations Vital Statistics Report Vol. I. No.5 of October 1947 are given in the following table. The Tuberculosis mortality rate for Singapore in 1947 is also shown.

Year	Death rates over 100		Year	Death rates under 100	
	City or town	Rate per 100,000		City or town	Rate per 100,000
1947	Singapore	235			
1946	Lisbon	367	1946	New York	42
1946	Bucharest	181	1946	Copenhagen	44
1946	Prague (R)	170	1945	14 towns N.Zealand (R)	44
1946	Vienna	164	1946	Paris (R)	78
1946	105 Bulgarian Towns	161	1946	Oslo (R)	61
1946	Rome (R)	159	1946	London (R)	63
1946	Dublin (R)	152	1946	Brussels & suburbs.	66
1946	Budapest (R)	143	1946	10 Swiss Towns(R)	67
1946	Cairo	112	1946	Belfast (R)	94
1946	Madrid	110			
1946	16 Scottish Towns (R)	101			

Where a capital "R" is given the rates refer to the resident (legal) popultion otherwise they apply to the "de facto" population.

When perusing the above table it must be borne in mind that the rates shown are all not truly comparable, for various reasons e.g. some of the rates are corrected for non residents dying in hospitals in the cities or towns and some are not. In some cases deaths from Tuberculosis in Military personnel are excluded etc. etc.

Some death rates from Tuberculosis per 100,000 of the population, taken from various sources, are given in the table which follows:-

	Year	Rate		Year	Rate
x1. Rangoon	1936	278	x1.	1939	174
x1.	1937	297	x1.	1940	213
x1.	1938	239			
x2.England & Wales	1946	53			
x2.Scotland	1946	78			

x1. Taken from Report of Health Administration City of Rangoon.

x2. Taken from United Nations Vital Statistics Report Vol. I. No. 5 of October 1947.

Though the General death rate and the death rate from Tuberculosis, the Pneumonias and other respiratory infections and in fact the death rate from most diseases in 1947 are the lowest ever recorded this does not mean that there is not still room for greater improvement. Even the lowest recorded mortality rate for Tuberculosis, which we had in 1947, is far above the rates prevailing today in many other cities and towns.

The high mortality rate from Tuberculosis and other respiratory infections are not the only evidence of the ill effects of overcrowding in Singapore. Our high death rates from Enteritis and many of our infant deaths due to infections were undoubtedly due in large part to the abominably overcrowded conditions in the town.

During and since the occupation, owing to the hyper-acute shortage of permanent type dwellings in the town a large proportion of the population has been obliged to live faut de mieux in innumerable insanitary temporary shacks many of which are built in higgledy-piggledy clusters the size of quite large towns scattered throughout the Municipal Area, even in the very heart of the town. For example, in the Geylang Serai Area alone, there are over 9,000 people living in a "town" made up of such shacks.

I don't think it would be an exaggeration to say that there are probably as many of these unauthorised insanitary shacks in the town today as there are approved "buildings" shown on the Municipal Assessors return for the year.

Needless to say these collections of shacks huddled together without proper provision for scavenging or drainage or sanitation, are a positive menace, not only to the occupants but also to the residents in the town as a whole.

During the year under review a Committee was appointed by Government to go into the whole question of housing in Singapore and inter alia "to prepare a preliminary plan as early as possible for building to relieve the present housing shortage". The Committee has gone into the question and I understand that their report will be put forward in the near future.

In years gone by several Commissions were appointed to report on and make recommendations with regard to the housing position in the town. Little useful purpose was served by these Commissions as the recommendations made in their reports were never fully implemented. It is to be hoped that the same thing won't happen with the report now being drawn up.

Some idea of the gigantic housing programme that is required can be gathered from the fact that not only has housing to be provided to ease the present overcrowded position but provision will also have to be made for the increase in the population, which, in 1947, showed a natural increase of 20,900 and an average annual increase of 14,703 between 1931 and 1947.

Only by the carrying out of huge housing schemes on a sufficiently large scale can we ever seriously hope not only that tolerably good and decent accommodation will ever be made available for the mass of the population but also that a really appreciable reduction can be effected in the incidence and death rate from the diseases fostered by overcrowding i.e. not only Tuberculosis but also the other respiratory infections, the Enteritis group of diseases etc.

30.8% of the total deaths were in infants under 1 year as compared with 22.4% in 1946, 29.56% in 1941 and 31.45% in 1940.

BERI BERI DEATHS IN 1931, 1936 AND 1947.

Year	Infants under 1 year		All Ages	
	Deaths	Rate per 1,000 live births	Deaths	Rate per 1,000 living
1931	8	0.48	651	1.46
1936	139	6.657	767	1.565
1947	65	2.128	383	0.568

In 1931 the diagnosis of Beri Beri in infants was poor. This undoubtedly explains the small number of infant deaths certified as due to this disease in that year.

INFANTILE DEATH RATE.

This was 97.6 per 1,000 live births as against 96.39 in 1946, 152.4 in 1941, 160.7 in 1940. The increased number of births registered in 1947 as against 1946 (i.e. 3,689) must necessarily have the effect of causing a lowering of the 1947 rate. Correcting for this by the method used by the Registrar General in the United Kingdom assuming that 30% of the infants dying during the year were born in 1946 the corrected rate for the year becomes 101.2.

INFANTILE MORTALITY BY RACES 1933 - 1947.

Year	Europeans	Eurasians	Chinese	Malays	Indians	Others	All Races
1933	33.0	121.6	176.1	246.0	128.5	88.6	176.5
1934	27.2	109.4	176.6	267.6	133.2	88.9	179.3
1935	13.8	80.0	172.4	225.7	136.0	86.9	171.2
1936	26.7	137.4	197.8	219.9	121.0	96.1	191.6
1937	12.2	109.9	172.4	229.9	139.5	72.2	171.9
1938	16.3	58.5	178.9	235.6	128.9	98.9	177.4
1939	39.4	79.6	150.3	188.4	91.6	96.9	147.7
1940	31.9	77.9	162.6	209.9	111.8	104.2	160.7
1941	21.6	48.6	152.5	211.6	102.8	143.6	152.4
1946	28.2	65.5	91.6	140.4	94.9	126.6	96.39
1947	52.0	84.3	93.4	144.1	81.8	109.9	97.6

Many of the factors, previously mentioned, which were responsible for the decline in the General Death rate undoubtedly also played their part in the causation of the lower infantile mortality in 1946 and 1947 than in prewar years. In addition other influences may have favourably affected the rates in 1946 and 1947.

For instance the high price and shortage of condensed milk in the early part of the year may have had the effect of increasing the amount of breast feeding which was done. Possibly there was some improvement in the care and health of infants due to the efforts of the Infant Welfare Department. There may have been less "unwanted" neglected infants etc.

The main causes of deaths and rates per 1,000 live births for each disease in 1947 are set out in the following table:-

	1947	
	Cases	Rates per mille
Convulsions	616	20.165
Bronchitis & Pneumonias	594	19.445
Diseases of Early Infancy	832	27.236
Diarrhoea & Enteritis	552	18.070
Tetanus	76	2.488
Beri Beri	65	2.128
Congenital Syphilis	23	.753
TOTAL.	2,758	90.284

The death rates per 1,000 live births for the main causes of deaths in infants under 1 year are shown in the table which follows for 1931, 1936, 1941 and 1946.

	1931	1936	1941	1946
Infantile Convulsions	57	40.9	27.507	18.876
Bronchitis and Pneumonias	41	39.29	28.109	18.839
Diseases of Early Infancy	39.9	33.384	31.878	31.684
Diarrhoea & Enteritis	30.1	30.65	27.226	12.882
Tetanus	4.0	12.55	5.734	2.420
Beri Beri	0.4	6.65	6.576	3.947
Congenital Syphilis	4.7	5.316	6.335	0.745

The mortality rates for the various diseases (except Diarrhoea and Enteritis) per 1,000 live births in 1947 are much the same as in 1946. The low death rate shown for beri-beri in 1931 (as compared with 1936, 1941, 1946 or 1947) was probably due to missed diagnosis rather a lower incidence of the disease then than in later years. The death rates from all the main diseases of infants especially congenital syphilis were much lower in 1946 and 1947 than in preceeding years. As by all accounts syphilis is very prevalent in Singapore today and this is borne out by the number of cases seen in infants and mothers at the Clinics it is surprising that so few infant deaths have been certified as due to it. The explanation must be either that such cases are taken more frequently and regularly for treatment than heretofore or else the correct diagnosis of many cases must be missed.

During the year under review 33% (756) of the total Chinese, 4% (20) of the Malays, 33% (63) of the Indian infants under 1 year died in Hospital. In 1941 the corresponding percentages were Chinese 41%, Malays 3.3%, Indians 33%.

The following tables show the births that occurred at the Government Maternity Hospital in 1946 and 1947, by race and sex and also the percentage of the total births of each race that were born at this Hospital.

1 9 4 6

NATIONALITY	MALES	FEMALES	TOTAL	PERCENTAGE OF TOTAL BIRTHS REGISTERED BY RACE.
Chinese	2,142	1,888	4,030	18.4
Indians	288	298	586	31.9
Malays	21	18	39	1.0
Europeans	29	20	49	69.0
Eurasians	60	69	129	46.8
Others	15	17	32	20.2

1 9 4 7

NATIONALITY	MALES	FEMALES	TOTAL	PERCENTAGE OF TOTAL BIRTHS REGISTERED BY RACE
Chinese	2,891	2,549	5,440	22.4
Indians	487	456	943	80.5
Malays	38	28	66	2.0
Europeans	103	106	209	90.4
Eurasians	70	59	129	38.8
Others	22	35	57	31.3

A comparison of these tables shows that a much larger number of Indian infants were born in the Government Maternity Hospital in 1947 than in 1946.

Deaths of infants during 1946 by race, sex, and age group and the Neo-Natal rates by race for 1947, 1946 and 1941 are shown in the tables which follow:-

1 9 4 7	Europeans			Eurasians			Chinese			Malays			Indians			Others			Total All Races		
	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total
0 - 1 day	4	2	6	1	1	2	82	72	154	27	10	37	11	13	24	4	2	6	129	100	229
1 - 7 days	3	1	4	3	2	5	199	121	320	23	14	37	20	16	36	-	5	5	248	159	407
1 - 4 weeks	-	-	-	1	2	3	221	235	456	43	32	75	16	19	35	-	1	1	281	289	570
0 - 4 weeks	7	3	10	5	5	10	502	428	930	93	56	149	47	48	95	4	8	12	658	548	1206
4 weeks to 3 months	-	1	1	5	5	10	235	226	461	77	45	122	19	12	31	2	-	2	338	289	627
3 - 6 months	-	-	-	-	2	2	198	150	348	55	42	97	8	15	23	2	1	3	263	210	473
6 - 9 months	-	-	-	2	3	5	142	130	272	34	24	58	10	15	25	3	-	3	191	172	363
9 - 12 months	-	1	1	-	1	1	135	118	253	24	16	40	6	10	16	-	-	-	165	146	311
Total 0 - 12 months	7	5	12	12	16	28	1212	1052	2264	283	183	466	90	100	190	11	9	20	1615	1365	2980

NEO-NATAL MORTALITY.

	1941.	1946.	1947.
Europeans	17.99	28.17	43.29
Eurasians	24.29	25.45	30.12
Chinese	48.39	41.89	38.36
Malays	47.38	49.68	46.09
Indians	36.40	33.82	40.90
Others	30.77	63.29	65.93
T O T A L.	46.91	42.03	39.48

The Chinese Neo-Natal rate in 1946 was 41.89, in 1947 it was 38.36 (i.e.) 3.53 points lower. The Chinese Male Neo-Natal rate was 40 in 1946 and 39.8 in 1947 i.e. it was approximately the same, whereas the Chinese female rate declined from 44 in 1946 to 36.7 in 1947 a decline of 7.3 points. This marked decline shown in the Neo-Rate for the Chinese females fully accounts for the reduction shown in the Chinese Neo-Natal (combined male and female) rate in 1947 as against 1946. Prior to 1947, as far as our records show, the Chinese female Neo-Natal rate had always been higher than the male rate. In 1947 the converse was the case.

The principal causes of death in the Neo-Natal age group are shown in the table which follows: the 1941 figures being given for comparison.

PRINCIPAL CAUSES OF NEO-NATAL DEATHS - 1947 & 1941.

DISEASES	1947		1941	
	No. of Cases	% Total Neo Natal Deaths	No. of Cases	% Total Neo Natal Deaths
1. Premature Birth	438	36.32	414	35.38
2. Congenital Debility	224	18.57	147	12.56
3. Infantile Convulsions	123	10.20	80	6.84
4. Atelectasis	81	6.72	61	5.21
5. Diarrhoea and Enteritis	79	6.55	48	4.10
6. Tetanus	73	6.05	137	11.71
7. Bronchitis and Pneumonias	60	4.97	25	2.13
8. Congenital Malformations	25	2.07	30	2.56
9. Icterus Neonatorum	21	1.74	34	2.91
10. Injury at Birth	19	1.58	38	3.25
11. Beri-Beri	18	1.49	18	1.54
12. Undefined or Unstated Causes	13	1.08	17	1.45
13. Congenital Syphilis	7	0.58	83	7.09
14. Diseases of Umbilicus	5	0.42	3	0.26
15. Septicaemia and Pyaemia	3	0.25	4	0.34
16. Pemphigus Neonatorum	1	0.08	0	0.00
17. Other Diseases	16	1.33	31	2.65
TOTAL.	1206	100.0	1170	100.0

As a matter of interest and as they have some bearing on the infantile mortality rates in various years I give beneath a table showing the percentage of births by races in the various census years:-

Year	Total Births	Chinese	Malays	Indians	Other Races	% of total births			
						Chinese	Malays	Indians	Other Races
1901	3,775	2,297	876	318	284	60.8	23.2	8.4	7.6
1911	5,560	3,750	1,051	406	353	67.4	18.8	7.3	7.52
1921	10,237	7,789	1,270	640	538	76.0	12.4	6.2	5.26
1931	16,488	13,229	1,758	917	584	80.23	10.66	5.56	3.54
1936	20,878	17,093	1,842	1,314	629	81.87	8.82	6.29	3.01
1947	30,548	24,247	3,233	2,323	745	79.3	10.5	7.6	2.44

The race and sex distribution of the still births registered in 1946 and 1947 are shown in the table which follows:-

STILLBIRTHS.

	1946			1947		
	M	F	Total	M	F	Total
Europeans	-	-	-	-	2	2
Eurasians	5	3	8	3	3	6
Chinese	211	184	395	220	169	389
Malays	39	32	71	58	29	87
Indians	44	27	71	42	52	94
Others	2	-	2	5	1	6
	301	246	547	328	256	584

The still birth rate per 1,000 total births of all races was 18.7 as against 19.9 in 1946 and 25.4 in 1941.

CERTIFICATION OF DEATHS - 1947.

The following return shows the number of deaths the causes of which were certified by Medical men:-

	Europeans	Eurasians	Chinese	Malays	Indians	Others	Total
Medicalman	36	68	4720	325	460	33	5642
Registrars	-	6	2182	811	184	14	3197
Coroner	12	3	630	59	85	20	809
TOTAL	48	77	7532	1195	729	67	9648

In the table which follows are shown the percentage number of deaths causes of which were certified by Medicalmen, Inspecting Registrars and the Coroner respectively for the years 1934 - 1941 and 1946 and 1947:-

	1934	1935	1936	1937	1938	1939	1940	1941	1946	1947
Medicalmen	62.8	65.7	66.9	68.5	71.0	69.0	68.7	68.9	57.16	58.48
Registrars	31.1	28.7	27.7	26.0	24.7	25.0	25.2	25.0	33.82	33.14
Coroner	6.1	5.6	5.4	5.5	4.3	6.0	6.1	6.1	9.02	3.39

VI AND VII. ANALYTICAL AND BACTERIOLOGICAL LABORATORIES.

Both reports are appended.

VIII. ANTI-MOSQUITO WORK.

Full details will be found in Dr. Hutchinson's report which is appended.

During the year the policy of giving priority to control of the breeding places of the vector mosquitoes while pressing on with the rehabilitation of the permanent anti-malarial works was continued. No new works were carried out during the year.

Available figures show that malaria was kept well under control while the record of the work done in the rehabilitation of the permanent works speaks for itself.

The desilting of the main channels was completed early in the year. Attention was then given to the many large tracts of land which had been used for vegetable cultivation during the Japanese Occupation. When cultivation ceased the lands became covered with thick undergrowth and blukar. On clearing this many ponds, pits, and seepages were uncovered. These were all actual or potential breeding places for mosquitoes. Many such areas remain to be dealt with.

Dr. Hutchinson again calls attention to the problem created by the presence of the squatter in our anti malarial ravines. The position is under survey and I hope to put up proposals to the Municipal Commissioners in the near future for consideration. As it may be accepted that the squatters' activities (which lead to much interference with the anti malarial works and the creation of breeding places for mosquitoes) are likely to continue for many years steps to minimise the potential dangers and nuisances arising from them will be essential. It is not a problem which is easily solved, for it is closely linked to general sanitary conditions on private lands.

An increase in oiling was necessary to deal with nuisance mosquito breeding in stagnant drains alongside both public and private roads.

Some re-organisation of the Department was effected during the year. This was considered necessary to ensure closer supervision.

With conditions as they are today anything like complete control of nuisance mosquito breeding cannot be effected without a considerable increase in staff.

IX. SUPERVISION OF MIDWIVES AND INFANT WELFARE.

The report of the Acting Lady Medical Officer is appended.

Throughout the greater portion of the year the Infant Welfare Department was handicapped by shortage of staff, and in the early part of the year, shortage of transport.

Owing to the large increase in the number of infants and shortage of staff the number of routine visits paid by the Health Visitors had to be considerably reduced.

During the year in addition to carrying out the normal work of the Infant Welfare Department the staff had to try to find time to treat sick babies and "toddlers" who were taken to the Clinics. The shortage of staff and accommodation at the hospitals necessitated such work being done at the Clinics.

In the three Clinics, during the year under review 23,257 infants were taken on the Register, 54,158 consultations were held, 1,723 Ante Natal and 1,385 Post Natal Mothers were seen.

The Health Visitors made 68,265 visits.

In connection with the Government Child Feeding Scheme 20,164 lbs of powdered milk were issued at the Clinics.

10,152 first and 8,565 second inoculations of A.P.T. were given during the year. 16,198 visits were paid to houses advising the parents to bring their infants to the Clinics for inoculation against Diphtheria. As an experiment in a few (42) selected cases a combined A.P.T. and Anti Pertussis Vaccine was used. Only two of these infants were brought back to complete the course of three injections.

The 4 Municipal Midwives attended 1,131 confinements and paid 7,003 visits to these cases. There were 5,736 self attended cases during the year.

The Staff Nurses visited 23,029 mothers in their homes.

A recommendation was made and agreed to by the Municipal Commissioners to open up in 1948 three new sub-clinics with quarters for Midwives. To test the suitability of two of the sites arrangements were made with the Singapore Improvement Trust to house temporarily two of the sub-clinics in the new blocks of shops and flats which are now being built at Tiong Bahru and at the Sungei Whampoa Area. The third sub-clinic is to be sited somewhere in the Kheam Hock Road-Adam Road-Dunearn Road Area.

The maternal mortality rate per 1,000 live and still births for 1946 and 1947 and some previous years are shown in the table which follows:-

MATERNAL MORTALITY RATES PER 1000 LIVE & STILLBIRTHS

Year	Number of Cases	Rate per mille (live & stillbirths)
1931	88	5.18 or 5.06 excluding Abortions
1936	91	4.24 or 4.10 " "
1941	117	4.57 or 4.38 " "
1946	103	3.76 or 3.47 " "
1947	80	2.57 or 2.44 " "
1942	England and Wales	2.47

The Puerperal Sepsis death rate per 1,000 live and stillbirths for 1946 and 1947 and some previous years are shown in the table which follows:-

PUERPERAL SEPSIS DEATH RATE PER 1000 LIVE & STILLBIRTHS.

Year	1931	1936	1941	1946	1947
	2.120	1.211	0.782	0.547	0.225

These Maternal Mortality and Puerperal Sepsis rates, especially those for more recent years, are remarkably low considering the conditions under which many confinements take place in the town. The very small percentage of the total number of maternal deaths which were certified as due to Sepsis is most unusual. For instance in the U.S.A. 34 - 40 percent of the maternal deaths are due to Sepsis.

X. FOOD AND MARKETS.

The report of the Market Inspector is appended.

10,932,366 katis of fresh fish were landed and auctioned at the Markets during the year.

In the Markets approximately 78 tons of unsound fresh foodstuffs, 1,441 lbs of assorted provisions, 1,600 poultry, and 7,930 eggs were seized or surrendered. 281 tons of unsound onions, potatoes and carrots, 7 barrels of unsound salt fish, 1,425 tons of yeast, 43 cases, 40,335 tins, 136 bottles and 1,556 tons of other unsound assorted provisions were surrendered, or condemned as unfit for human consumption and sent to the Incinerator for destruction or otherwise disposed of in an effective way.

During the year a Special Markets Committee was appointed to go into the question of Markets in general, and the proposed Wholesale and Retail Markets at Ellenborough and Telok Ayer in particular.

FOOD SHOPS ETC.

Licences were issued for:-

	1946	1947
Eating Houses	1,077	1,008
Coffee Shops	180	177
Soda Fountains	113	46
Meat and Fish Shops	111	101
Bakeries	26	27
Cake Shops	45	41
Biscuit Factories	5	5
Aerated Water Factories	9	9
Milk Vendors	103	71
Sweetmaking	-	6
Iced Water Cold Drinks	133	79
Foodshops	38	21
Fruit Drink Factory	-	1
Dairy Shop	-	3
Margarine Factory	1	1
Ice Popsicle Factory	-	1
Syrup making	-	2
Ice Cream Factory	-	1
Food Caterer	-	1

These premises were regularly inspected by the District Sanitary Inspectors.

XI. PLACES OF PUBLIC RESORT

Theatres, Hotels, Public Houses, Schools, etc. were regularly inspected and the necessary reports submitted at the request of the several Licensing Authorities.

XII. SLAUGHTER HOUSES.

During the year 282,459 animals were slaughtered in the Municipal Abattoirs. These were distributed as follows - the 1946 figures being given for comparison:-

	1946 (From 1/4/46 - 31/12/46)	1947
Pigs ...	159,615	222,778
Sheep ...	22,677	51,712
Goats ...	147	1,038
Oxen ...	2,191	2,608
Buffaloes ...	4,028	4,322
Horses ...	74	1

55 carcases were totally condemned: 26 being swine, 2 buffaloes, 26 sheep and 1 goat.

Night slaughtering had to be allowed, throughout the year, in the Pig Abattoir as work on the reinstatement of the Chilling room had not been completed by the end of the year.

XIII. OFFENSIVE TRADES.

313 licences, 268 of these for laundries, were issued during the year, the fees collected being $8,304.00. All these licensed premises were subject to the usual routine inspections.

XIV. BURIAL GROUNDS.

There were 8,344 burials during the year, the races being as follows:-

Europeans	117
Eurasians	93
Chinese	6,086
Malays	1,194
Indians	788
Others	56
Total.	8,334

Of the total burials 6,806 took place in the Municipal Cemeteries.

There were 84 exhumations during the year carried out under the supervision of the Burial Ground Inspector. The same officer paid 812 visits of inspection to Municipal and other Cemeteries.

There were 115 cremations.

The Chinese Cemetery at Bukit Brown was closed on 1/1/47 except for burials in the reserved grave-plots. There were 25 such burials.

Between January 1st and May 31st there were 2,007 Chinese burials in the "temporary" burial ground at Coronation Road. This cemetery was then closed and the Chinese Section at the new Choa Chu Kang Cemetery opened for use.

XV. S T A F F.

LEAVE

Dr. H.R. Morrison, Senior Assistant Health Officer, went on long leave to Europe on 17th April and returned to duty on 7th November.

Dr. Mary Tan, Lady Medical Officer in charge of the Infant Welfare Department proceeded on long leave to the United Kingdom etc. on March 6th.

RESIGNATION.

Dr. C.H. Yeoh, Assistant Health Officer, resigned from the Municipal Service on November 1st.

APPOINTMENTS.

Dr. Thora Oehlers was appointed as second Assistant Lady Medical Officer in February.

Mrs. J. A. Dean was appointed as temporary Sister Infant Welfare Department from January to June 1947.

Miss J. Horrocks was appointed as Sister in the Infant Welfare Department in June.

Mr. T.A. Spillane was appointed Deputy Municipal Analyst in September.

HEALTH OF SUBORDINATE STAFF.

10,093 cases were attended to in the Dispensary during the year. 462 were sent to Hospital and 66 to various Clinics. 30 visits were made by the Medical Officer in charge Staff. 678 were treated by Private Practitioners. 46,718 days sick leave were granted and the daily attendances at the dispensary totalled 29,194.

1,283 examinations for physical fitness were made.

The chief causes of sickness were Influenza 5,305, Pyrexia of unknown origin 1,292, accidents and injuries 1,246, Septic Wounds and Ulcers 929, Bronchitis 706, Conjunctivitis and Diseases of the Eye 475.

There were 64 primary attacks of malaria.

XVI. GENERAL.

There were 75 Notices including 45 intimations served during the year. 107 Notices were brought forward from the previous year making a total of 182. Of these 156 were complied with and 26 carried forward to the following year.

There were 30,885 visits of inspections paid by the Sanitary Inspectors, 413 prosecutions, 359 convictions with fines imposed amounting to $7,340.50 while 23 prosecutions were withdrawn and 31 summonses could not be served.

During the year many of the Sanitary Inspectors were employed on part time census duties.

Though it was fully appreciated that many of the houses in the town were in a most insanitary condition and in need of repair action had to be reduced to an absolute minimum owing to the scarcity and high price of building materials and the high cost of labour. Owing to the hyper-acute housing shortage no effort could be made to deal with numerous insanitary cubicles and shacks etc. throughout the town.

No action was taken to abate overcrowding as due to the hyper-acute housing shortage no useful purpose could have been served by so doing.

An application, sponsored by the Municipal Commissioners was made by Miss Veronica Au for one of the Colonial Scholarships in Tuberculosis which were offered, thanks to the generosity of the United Kingdom National Association for the prevention of Tuberculosis. Early this year word was received that Miss Au had been selected for one of these scholarships. She is due to sail to the United Kingdom in the near future to take the course which is run under the auspices of the Association. The course will include practical work in Sanitoria or Tuberculosis Hospitals and work in Tuberculosis, Dispensaries etc.

The following reports and returns are appended:-

Anti-Mosquito Report.
Report of the Analyst.
Report of the Bacteriologist.
Report of the Infant Welfare Department.
Report of the Superintendent Middleton Hospital.
Report of the Market Inspector.
Report of the Superintendent Abattoirs.
Chief Sanitary Inspector's returns.

I conclude by recording my grateful thanks to all members of the department, both Senior and Subordinate, for their continued loyal support.

I have the honour to be,
Sir,
Your obedient servant,

N. A. CANTON, M.B., CH.B., B.A.O., D.P.H.,
MUNICIPAL HEALTH OFFICER.

MUNICIPAL HEALTH OFFICE,
Singapore, 26th February, 1948.

The Municipal Health Officer,
SINGAPORE.

Sir,

I have the honour to submit the following report on the work of the Anti-Mosquito Department during the year 1947.

In my report for 1946 I recorded that "It is disappointing ..... material progress has not been greater". It is, therefore, a cause of some satisfaction that I can report that considerable headway was made with the rehabilitation of the permanent anti-malarial works during the year. We cannot, however, congratulate ourselves, as yet, that we have by any means completed the rehabilitation programme or reached the pre-war standard of maintenance in many of our areas.

During 1947 our primary concern has continued to be the question of malaria control, while pressing on with the rehabilitation of the permanent works. No new works or major additions to existing works were carried out during the year.

As regards malaria control it is a fact that the malaria rate throughout the country has been low during the year and so perhaps we cannot claim too much. At the same time from available figures it would seem that we have ensured effective control.

During the year 375 cases of malaria were notified to us from the General Hospital and Tan Tock Seng Hospital. 282 of these cases came from addresses within Municipal Limits, 131 coming from the central area of the town. It can be considered improbable that cases from the central areas contracted the infection there. Investigations in the past have shown that many of these town addresses are accommodation addresses only. There were, therefore, 151 "Possible" Infections of which 58 gave addresses in the Sungei Whampoe, Kallang and Geylang Areas which are our A. sundaicus areas, and in which little rehabilitation work has yet been attempted. Our Municipal Staff Returns show that 14,093 patients were treated at the Municipal Dispensary of which 1,579 had blood films taken on account of fever. Only 98 of these films were positive for malaria and of these 34 were definite relapse cases. As the Municipal employees are accommodated in all parts of the Municipal Area - these figures do provide a useful check and, while not attaching too much weight to either these or the figures from the hospitals, I think they can be taken as some indication of the effectiveness of malaria control.

I put up in Appendix I a Table showing the location of our anti-malarial areas and giving the details of the types and length of drainage in each area. The Table is of interest because it not only is a record of the work and materials that have gone into the permanent anti-malarial works since their inception but it gives significance to the rehabilitation programme we are carrying out. The letter 'C' in column 3 against an area denotes that rehabilitation work has been completed in that area. Appendix II gives the details of the work carried out in the areas during the year.

Permanent Works.

At the end of 1946 we had completed repairs to the main and subsidiary channels in 12 areas, and work was in progress in 18. During the year work was completed in 14 of these areas and a further 36 areas were dealt with. Work was in progress in 10 areas at the end of the year. In addition 4 areas, drained by subsoil pipes only, were dealt with.

There were, at the end of 1947, 152,761 yards of permanent concrete channels in our anti malarial areas. The degree of damage in any particular area varied considerably. In some almost the whole drain required attention, while in others perhaps only a few inverts or slabs had to be replaced. Progress therefore may perhaps be better appreciated by the fact that in 1946 we had put back into repair some 12,529 yards of our 152,761 yards of drainage, while in 1947 a further 51,105 yards were dealt with, making a total since rehabilitation work commenced of 63,634 yards. At the end of the year work was in progress in areas totalling 25,522 yards, so that we have rehabilitated 41.6% and have in hand a further 16.9% of the total length of permanent drainage.

The materials laid by the masons during the year were:

Anti Malarial type concrete inverts	21"	-	3114
	18"	-	4412
	15"	-	1122
	12"	-	2145
	9"	-	287
Revetment Slabs	18"	-	32501

Sub-soil Pipe Drainage.

At the end of 1947 the total length of subsoil pipe drainage existing in the anti-malarial areas was 200,575 yards. During 1946, 716 yards were taken up and relaid and in 1947 a further 3,060 yards were dealt with. Extensions to existing subsoil pipelines in 30 of the areas called for the laying of 1,960 six-inch and 694 four-inch pipes. 4,506 six-inch subsoil pipes were used in trapping new dangerous seepages.

It is impossible to estimate the work that still lies ahead of us in dealing with the subsoil pipelines. Many of the areas have still to be cleared of undergrowth before a detailed examination can be made.

In many of the ravines the subsoil pipelines have been interfered with by squatters who have cut the pipelines in order to provide a water supply.

Earth Drains.

At the end of 1947 there were 28,766 yards of earth drains in the anti-malarial areas. Practically all this drainage has been brought back under control with the exception of that in two important areas namely No.101-McPherson Road and No.140-Playfair Ravine.

During the occupation the hill at Kampong Ampat was cut into and a strip of land presumably for use as a 'fighter strip', extending from Alkaff Avenue to Paya Lebar Road was raised by earth taken from the hill. This filling not only completely blocked the two main outlet drains from the McPherson Road and Playfair Ravines causing swamps to form at Paya Lebar Road and Upper Aljunied Road, but also interfered with the efficiency of a number of subsidiary areas within the triangle - Upper Serangoon Road, Paya Lebar Road and McPherson Road. It is intended, if possible, to deal with the Playfair Ravine during 1948. In addition to the upkeep of earth drains in our recognised anti-malarial areas a considerable amount of clearing and regrading of earth drains was carried out by our Patrol Gangs in the Siglap, Geylang and Changi Road Areas - particularly the earth drains in the Lorongs.

Oiling.

The extensive oiling programme carried out in 1946 was continued throughout 1947, the total amount of anti-malarial mixture used being 71,584 gallons or 5,965 gallons a month. All anti-malaria mixture used during the year contained 1% D.D.T. During the year, in addition to oiling breeding places of malaria-carrying mosquitoes, it was found necessary to do a considerable amount of oiling of choked roadside drains where "nuisance" mosquitoes were found breeding. The position had, in this respect, improved

slightly towards the end of the year. Considerable quantities of oil are still required in the Jalan Besar, Eastern Reclamation, Singapore River, Kallang Basin, Sungei Whampoe, Geylang and Siglap Areas, most of which are potential breeding places for A. sundaicus.

General Work.

At the beginning of the year the work of desilting the main outlet drains was continued. On completion of this several large tracts of land including areas at Paya Lebar, Wayang Satu, Watten, Monk's Hill, Farrer Road, Stevens Road, One Tree Hill, and an extensive potential A. sundaicus breeding place between Havelock Road and River Valley Road were dealt with. These areas had been used for cultivation of vegetables during the Japanese Occupation. Cultivation having ceased the areas had "run wild" and many breeding places for mosquitoes existed in wells, ponds and stagnant earth drains hidden in the undergrowth. The work involved clearing of heavy undergrowth, levelling of the ground, filling in of wells and ponds and drainage. Many other similar areas remain to be dealt with notably at Balestier, Sungei Whampoe Basin, Berdemeer, Dunearn Road and the area between Mountbatten Road and Guillemard Road.

Considerable work has, also, to be carried out in a number of anti-malarial areas in which serious interference with the permanent works took place during the occupation period. The most important of these areas are:-

Area 22 Jervois Road Number 3 - This main drain takes the Tanglin Road - Chatsworth Catchment Area and was controlled by an automatic tide gate where it enters the Alexandra Road Canal. The tide gate has been completely destroyed. The main outlet, itself, was obstructed by fencing when certain lands along Alexandra Road were "fenced in" as a "Protected Area". Towards the latter part of the year the question was taken up with the Service Authorities who agreed to move the fencing so as to give us access to the drain. A new tide gate will have to be constructed.

Area 105 Bukit Permei. - The floor of this ravine was raised in order to provide rail access to the head of the ravine. The anti-malarial drains were completely destroyed and it will be necessary to level off the whole ravine floor, fill in the head of the ravine and construct a new anti-malarial channel.

Areas Nos. 101 and 140. - As stated above these areas have to be completely opened up.

Area 165 Burn Road Ravine. - As mentioned earlier the hill at Kampong Ampat was cut away in order to provide earth for a "fighter strip". As a result this ravine was practically obliterated, the main channel and subsoil pipelines being removed. What remains of the ravine will have to be dealt with when the Playfair Road main drain has been opened up again.

Mosquito Control.

While, as I have already stated, we have given priority to malaria control and rehabilitation work, the problem of the control of "nuisance" mosquito breeding, which exists on a scale unknown pre-war, has been a cause of considerable concern. When one considers the pre-war standard of maintenance of our areas one must feel doubtful if it can, or ever will, be reached again for to achieve it means that the squatter must abandon his activities in the ravine floors.

I referred to this question of the squatter and mosquito control in my report last year and I again draw attention to it as I do not think that the development which has taken place in the "rural areas" of the town is fully appreciated. The big increase in population there has been in the "rural" Mukims was confirmed by the recent Census. For example in 1936 the population of Mukim 1 - bounded by Telok Blangah Road, Outram Road, Havelock Road and Alexandra Road - was 26,512, in 1947 - 56,205, and other Mukims show similar increases.

True some of the increase in Mukim 1 follows permanent development, for instance, the Improvement Trust flats in Tiong Bahru, but the main increase is due to squatters, housed in temporary plank and attap dwellings. To give some idea of the extent of their activities (in the main pig-rearing and vegetable cultivation) in the area bounded by Alexandra Road, Railway Line, Kampong Bahru Road, Outram Road and Tiong Bahru Road there are now 600 ponds devoted to the growth of pig food etc. where pre-war there was none. Ponds, night-soil pits, wells, stagnant drainage due to the erection of huts without any layout are all breeding places for nuisance mosquitoes. Nor is the squatter confined to any particular area - he has settled in nearly all areas. "Control" is an impossible problem without taking drastic and, under present circumstances, possibly unjustified measures.

Quite apart from the extensive breeding due to the activities of the squatter there is, also, much breeding instagnant roadside drains on both public and private roads. In an effort to reduce this it was found necessary to extend our oiling to cover many of these drains, and the quantity of oil used rose from approximately 4,000 gallons per month in 1946 to nearly 6,000 gallons per month in 1947. No substantial reduction in this figure can be expected until more regular and efficient cleansing of the towncan be re-established. In dealing with breeding in roadside drains, it is not generally realised that the Town Cleansing Department is not responsible for clearing drains in private streets or on private lands. In fact the householder in such streets does not realise the responsibility which falls on him to ensure that the drainage in his compound and on his frontage is maintained properly. Much breeding was found in choked drains in private roads and on private lands and it seemed to occur to very few householders that they could, in many cases, in less than one minute remove the cause of the blockage themselves and so destroy the mosquito-breeding place.

This question of sanitation in private streets and roads is, I may say, under active survey, and it is hoped to put up proposals to the Municipal Commissioners for consideration in the near future. It is a very difficult problem. I mention it here as it is inseparable from mosquito control. And one must not imagine that the mosquitoes are confined to our "rural" areas; we must not lose sight of the thousands of breeding places for mosquitoes which exist in the very heart of the town itself in the hundreds of dumps of water bearing receptacles, from the abandoned army tank to the empty tin.

GUNONG PULAI AND PONTIAN.

No major works were necessary during the year. The permanent works have been kept in good repair.

The lines in both camps are now regularly treated with D.D.T. solution in kerosene.

RE-ORGANISATION OF THE ANTI-MOSQUITO DEPARTMENT.

With, what is possibly now a permanent feature in our work, the presence of the squatter in the ravines, and the necessity for more constant supervision it was felt that some re-organisation of the Department was desirable. Accordingly certain proposals were placed before the Municipal Commissioners in August. These were approved and will come into effect as from 1st January 1948. In place of the two Senior Sanitary Inspectors who, pre-war, were responsible for all maintenance work, one for the North Side Division and one for the South Side Division, two new posts of Anti-Mosquito Inspector were suggested. These will be filled by the promotion of two Overseers. These Inspectors will exercise a general supervision over maintenance and construction work on either side of the town. The town willbe divided into six sections, each with an Overseer in charge. Each Overseer will have a certain number of gangs under his constant supervision. It is hoped that as the Overseer goes round his section with his gangs he will be able to maintain closer contact with the squatter, not only with the object of curbing some of his activities, but also of educating him as to what he may and may not do. It is a fact that many squatters do try to co-operate when we bring matters to their attention; just as there are, on the other hand, many who deliberately camouflage a well or night-soil pit in the hope that it may escape discovery. The appointment

of additional Larvae Searchers and Field Workers was, also, approved. No increase in the Labour Force was recommended - it being considered that the force was as large as could be economically employed. The supply of materials, cement in particular, is also a limiting factor in the rate of progress.

Mosquito Surveys.

2,478 collections of anopheline larvae were examined and identified in the laboratory. Of these 54 were A. maculatus and 92 A. sundaicus. Some of these collections were made following a deliberate stoppage of oiling, as a control test, in certain areas.

General Anti-Mosquito Work.

Patrol Gangs, on regular rounds, cleared and regraded earth and concrete drains outside our recognised anti-malarial areas. These Gangs also collected and disposed of 6,709 large baskets of empty tins.

Notices.

16 Notices under the Destruction of Mosquitoes Ordinance were served during the year.

General.

The entire Labour Force ceased work during the strike at the beginning of the year. Fortunately we were able to continue oiling the more potentially dangerous breeding places.

The Inspectors and Overseers have again this year carried out their onerous duties with great credit to them and it is largely due to their enthusiastic efforts that progress has been so steadily maintained throughout the year.

I have the honour to be,

Sir,

Your obedient servant,

Sgd. W. E. Hutchinson.
M.A.,M.D.,D.P.H.,J.P.
DEPUTY HEALTH OFFICER.

APPENDIX I.

ANTI-MOSQUITO DEPARTMENT.

TOTAL LENGTH OF CONCRETE CHANNELS, SUBSOIL PIPES AND EARTH DRAINS IN YARDS BY AREAS AT END OF 1947.

Area No.	A R E A	Earth Drains	Concrete Channels	Subsoil Pipes
1	Anderson Road	-	159	2532
2	Barker Road	-	50	1018
3	Bukit Timah Road	-	3168	-
4	Claymore	-	1449	788
5	Cluny Ravine	-	1199C	1742
6	Cuppage Road	-	236	567
7	Glencaird	-	1371C	2959
8	Kings Road, Tyersall	-	1057	3758
9	Nassim & Dalvey	-	1427C	3570
10	Fern Hill	-	1337C	1594
11	Paterson Road	-	421	270
12	Scotts Road Railway	-	936	73
13	Stevens Road	-	1091	1291
14	Watten	-	1835C	3602
15	Woodleigh	-	1770C	3837
16	Tyersal Pond	-	240	1747
17	Chandu Ravine	-	132C	1784
18	Hammers Ravine	-	80	876
19	S.H.B. Ravine	-	398C	3822
20	Jervois Road No.1	-	991	2842
21	Jervois Road No.2	-	232	496
22	Jervois Road No.3	-	1769C	988
23	Keith Swamp	-	264	1391
24	Leonie Hill	-	459	841
25	Morse Ravine	-	258	1962
26	Mosque Ravine	-	96	1981
27	One Tree Hill	-	1143C	2663
28	Orchard Road No.1	489	528	620
29	Orchard Road No.2	-	333	1165
30	Orchard Road No.3	-	248	246
31	Paya Goyang	-	717	-
32	Radin Mas	-	2265C	1694
33	River Valley Road	-	357	508
34	Shanghai Road	-	51C	485
35	Tiong Bahru	-	5977C	4411
36	Wishart	-	1443C	2378
37	Woodneuk	-	346	377
38	Alexandra Swamp	3852	775	229
39	Balestier Plain	288	1205	-
40	Cluny Road Ravine	-	556C	786
41	Gallop Road	-	1589	1529
42	Grange Road	-	1175	301
43	Holland Park 1	-	982C	2060
44	Holland Park 2	-	559C	1477
45	Holland Road	-	781	628
46	Melrose	-	359	755
47	Newton Pond	-	1096C	140
48	Rochalie	-	528	217
49	Swettenham Road	-	1069C	944
50	Tanglin Barracks No.1	-	1315C	3057
51	Tanglin Barracks No.2	-	2273C	5162
52	Tanglin Barracks No.3	-	1953	4005
53	Tanglin Hill No.1	-	223C	2090
54	Tanglin Hill No.2	-	1129C	1994
55	Fort Canning	-	209	753
56	Henderson Road	-	2623C	420
57	Bukit Brown	830	-	10307

Area No.	A R E A	Earth Drains	Concrete Channels	Subsoil Pipes
58	Kampong Java	-	1806	582
59	Moulmein Road	-	-	343
60	Keppel Golf Club	-	163	939
61	Mandai Quarry	-	828	2904
62	Kramat Road	-	-	52
63	Swiss Cottage No.1	-	1336C	3102
64	Thomson & Chancery Lane	-	252	174
65	Botanical Gardens	-	-	98
66	Tanglin Road Ravine	-	-	469
67	Spottiswoode Park	-	1835C	682
68	Pearls Hill	-	341	1085
69	Balestier Road Ravine	-	108	900
70	Chancery Lane No.1	-	1345C	505
71	Tanglin Post Office	-	265	170
72	Irwell Bank	-	27	282
73	Mandalay Road	-	237C	119
74	Mackenzie Road	-	28	210
75	Government Hill	-	278	190
76	Napier Road	-	-	110
77	Goodwood Hill (27, Scotts Road)	-	-	-
78	Scotts Road No.1	-	311	20
79	Serangoon Village	-	1564C	393
80	Economic Garden	-	1507	651
81	Mount Rosie	-	3492	4035
82	General Hospital	-	-	120
83	Swiss Cottage No.2	-	-	1127
84	Chancery Lane No.2	-	125C	426
85	Ewe Boon Road	-	253	568
86	Sarkies Road	-	-	259
87	Thomson Balestier Road Ravine	260	568	-
88	Jewish Cemetery	-	970C	450
89	Kampong Bahru "Silat Road"	-	-	-
90	Outram Road Ice Factory	-	131	439
91	Holland Bukit Timah Road	-	4029	2299
92	Holland Park No.3	-	-	177
93	Bukit Timah Filters	-	366C	150
94	Bushy Park	115	211	344
95	Nassim Road	-	33C	868
96	Western Reclamation	-	1541C	2195
97	Wee Avenue	-	200C	120
98	Chinese High School	-	-	115
99	Tanjong Rhu	-	-	48
100	Adam Park	-	3812	10267
101	McPherson Road	2580	1247C	3454
102	St. James	-	50	-
103	Maxwell Road	-	33	153
104	Katong	-	810C	-
105	Bukit Permei	-	648	781
106	Jalan Besar	320	837C	-
107	Wayang Satu	-	5602	7352
108	Berlayer Village No.1 & 2.	-	-	1013
109	Mt. Pleasant	360	3019C	3693
110	McRitchie Reservoir	54	3708C	6036
111	Thomson Road	2714	297	156
112	Rangoon Road	-	137	155
113	Kheam Hock Road	-	625	206
114	Dunearn Road	-	1094	2435
115	Alexandra Road Ravine	-	1933C	6070
116	Sungei Whampoe (main drain)	-	120	138
117	Telok Blangah Road Ravine	-	923C	1568
118	Kallang Reservoir (Island Golf Club)	-	1105	1758
119	Scotts Road No.3 (X No.14 Scotts Road)	-	78	135
120	Kim Seng Area	-	1012	488

Area No.	A R E A	Earth Drains	Concrete Channels	Subsoil Pipes
121	Alexandra Road Brick Factory Ravine	308	2888C	5626
122	Alexandra Road 4 mile Ravine	-	834	785
123	Alexandra Road Kampong Limau	-	1393C	827
124	Alexandra Road Cemetery Ravine	-	828C	611
125	Alexandra Road Faber Ridge Ravine.	-	578C	681
126	Alexandra Road Temple Ravine	994	275	485
127	Henderson Road West Ravine	799	672	541
128	Race Course Ravine	-	-	321
129	Sungei Namly Ravine	1396	1529	1085
130	Mount Washington Ravine	-	5071	4318
131	Joo Chiat Area (no record of length)	-	-	-
132	Bugis Estate Ravine	-	1238	1561
133	Kallang Basin (main drain)	150	5381C	379
134	Bendemeer	-	1141C	793
135	Kim Keat Road Ravine	-	1693	-
136	Boon Teck Road Ravine	-	2926	1176
137	Tai Jin Ravine	-	5830C	529
138	Ah Hood Road Ravine	350	4355C	599
139	Kampong Wak Tanjong	880	-	-
140	Kampong Playfair Ravine	2508	-	-
141	Thomson Road No.5	-	321C	232
142	Thomson Road No.2	-	293C	127
143	Potong Pasir	1760	-	-
144	Hindoo Cemetery Ravine No.1	141	77C	-
145	Hindoo Cemetery Ravine No.2	-	360C	322
146	Mohamedan Cemetery Ravine	-	78C	632
147	Woodsdale Ravine	840	249C	127
148	Serangoon Road Ravine	-	139C	350
149	East Lynn Ravine No.1	248	-	-
150	East Lynn Ravine No.2	260	-	-
151	Hokien Cemetery Ravine No.1	260	-	114
152	Hokien Cemetery Ravine No.2	480	-	-
153	St. Michaels Road	-	171	370
154	Thomson Road No.4	-	617	456
155	Thomson Road No.1	-	165	347
156	Thomson Road No.3	-	86	253
157	Alkaff Avenue	2473	-	-
158	Jalan Datoh Ravine	150	500	187
159	Kampong Sambau	-	446	-
160	Kampong Martin	-	167	33
161	Vaughan Road Ravine	-	-	489
162	Kampong Bintang	-	-	103
163	Thomson Road No.6	-	-	910
164	Woodsville	-	613	256
165	Burn Road Ravine	-	-	-
166	Craig Road Railway	-	844	700
167	Carey Road	-	170C	52
168	Thomson Road No.7	302	-	366
169	Havelock Road	-	209	227
170	Braddell Road	2300	754C	333
171	Bukit Hoe Swee	-	190	100
172	Wolskel Road	-	817C	332
173	Beo Lane	305	-	-
174	Chasseriau Estate Ravine	-	1267C	-
175	Bidadari	-	124C	1530
		28766	152761	200575

APPENDIX II.

REPAIRS TO EXISTING WORKS.

Area No.5 Cluny Ravine.

90 twentyone-inch, 90 eighteen-inch concrete inverts, and 533 eighteen-inch revetment slabs were relaid.

Dangerous seepages were dealt with by laying 190 six-inch subsoil pipes.

Area No.9 Nassim & Dalvey Ravine.

70 twelve-inch concrete inverts and 490 revetment slabs were relaid.

Area No.10 Fernhill Ravine.

53 twentyone-inch, 56 eighteen-inch, 70 twelve-inch concrete inverts and 655 revetment slabs were relaid.

Area No.14 Watten Estate.

51 twentyone-inch, 16 eighteen-inch concrete inverts, 1,524 revetment slabs, 2 six-inch and 25 four-inch subsoil pipes were relaid.

Area No.15 Woodleigh Filters.

90 eighteen-inch, 20 twelve-inch concrete inverts and 230 revetment slabs were relaid.

Area No.17 Chandu Ravine.

Pre-war the subsoil pipes in this ravine discharged into concrete tanks from which the Chandu Factory drew its water supply. The factory having closed, this supply was no longer required. Accordingly the tanks were demolished and an anti-malarial type channel was laid in the head of the ravine, outcropping seepages were subsoil piped and a washing place was provided for use of the squatters in the ravine. 40 eighteen-inch concrete inverts, 100 revetment slabs, 10 six-inch and 140 four-inch subsoil pipes were relaid.

Area No.19 Singapore Harbour Board Ravine.

2 twentyone-inch concrete inverts were relaid.

Area No.20 Jervois Road No.1 Ravine.

6 twentyone-inch, 84 eighteen-inch, 80 fifteen-inch, 120 twelve-inch concrete inverts, 870 revetment slabs, and 20 four-inch subsoil pipes were relaid. Work in progress.

Area No.21 Jervois Road No.2 Ravine.

A choked six-inch subsoil pipeline was taken up for a distance of 43 yards and relaid.

Area No.25 Morse Ravine.

20 eighteen-inch concrete inverts, and 30 revetment slabs were relaid. Work in progress.

Area No.26 Mosque Ravine.

A landslide caused seepages to outcrop. These were dealt with by laying 110 four-inch subsoil pipes.

Area No.27 One Tree Hill.

60 twentyone-inch concrete inverts and 240 revetment slabs were relaid.

A road, built by the Japanese across the floor of this ravine, caused seepages to outcrop. These were dealt with by laying 360 six-inch subsoil pipes.

Area No.32 Radin Mas.

This area was severely damaged during the occupation.

A large brick building was erected in the floor of one of the subsidiary ravines the foundations of which completely disrupted the main subsoil pipeline. Further interference was caused by the construction of an access road, the earth for which was obtained by cutting into the high ground causing seepages to appear. The main anti-malarial drain was, also, badly damaged.

260 twentyone-inch, 101 eighteen-inch, 95 twelve-inch, 25 nine-inch concrete inverts, 1,015 revetment slabs, 300 six-inch and 200 four-inch subsoil pipes were relaid.

Area No.34 Shanghai Road Ravine.

80 eighteen-inch, 40 twelve-inch, 30 nine-inch concrete inverts, and 60 revetment slabs were relaid.

Area No.35 Tiong Bahru.

It has been impossible, due to the activities of the greatly increased number of squatters in the ravines, to bring this area back to anything like pre-war standard. Many ponds have been dug for the purpose of growing pig food. Pig, duck and poultry rearing is carried on on a large scale, and all possible ground is cultivated. Herds of swine run freely about the area. The main drain was completely "lost" under tons of refuse and we had difficulty in actually locating it. This drain was cleaned out but, as it is used as a refuse chute, it requires constant attention. Subsidiary drains have been cleaned and many ponds filled.

The drains, when cleaned out, were found to be badly damaged and called for the relaying of 120 twentyone-inch, 280 eighteen-inch, 85 twelve-inch, 67 nine-inch concrete inverts and 1,020 revetment slabs.

Area No.36 Wishart Ravine.

A number of "fox holes" were cut into the ravine slopes by the Japanese to provide protection for lorries etc. during bombing. These excavations caused seepages to be exposed which were dealt with by laying 292 six-inch, and 240 four-inch subsoil pipes. 30 twentyone-inch concrete inverts and 155 revetment slabs were relaid.

Area No.40 Cluny Road Ravine.

The whole of the anti-malarial concrete channel in this ravine had to be relaid, and the ravine floor cleared of undergrowth.

30 twentyone-inch, 798 eighteen-inch, 10 nine-inch concrete inverts, 960 revetment slabs, 15 six-inch and 10 four-inch subsoil pipes were relaid.

Area No.41 Gallop Road Ravine.

90 eighteen-inch, 80 fifteen-inch concrete inverts, 400 revetment slabs and 10 six-inch subsoil pipes were relaid. Work in progress.

Area No.43 Holland Park No.1 Ravine.

4 twentyone-inch, 83 eighteen-inch concrete inverts, 267 revetment slabs, 180 four-inch subsoil pipes were relaid. Outcropping seepages were dealt with by laying 150 six-inch subsoil pipes.

Area No.47 Newton Ponds.

25 twelve-inch concrete inverts and 50 revetment slabs were relaid.

Area No.49 Swettenham Road Ravine.

30 twentyone-inch, 17 fifteen-inch concrete inverts, 509 revetment slabs and 35 four-inch subsoil pipes were relaid.

Area No.50 Tanglin Barracks No.1.

17 eighteen-inch concrete inverts, 863 revetment slabs, 250 six-inch and 25 four-inch subsoil pipes were relaid.

Area No.51 Tanglin Barracks No.2.

Considerable damage was done to the permanent anti-malarial works in this area and, owing to the creation of potential breeding places for malaria-carrying mosquitoes, oiling was necessary as an immediate measure. It had not been possible to deal with the damage before the close of the year.

In the lower reaches of the ravine the main concrete drain was repaired by relaying 30 eighteen-inch concrete inverts, and 320 revetment slabs.

Area No.53 Tanglin Hill No.1.

40 eighteen-inch concrete inverts, 90 revetment slabs and 35 six-inch subsoil pipes were relaid.

Area No.54 Tanglin Hill No.2 (Firestone).

180 eighteen-inch, 10 twelve-inch concrete inverts, 1,140 revetment slabs and 35 six-inch subsoil pipes were relaid.

Area No.56 Henderson Road Ravine.

57 eighteen-inch, 25 twelve-inch concrete inverts and 217 revetment slabs were relaid.

A.M. Area 57 Bukit Brown Golf Course.

This area consists of six ravines lettered A to F. To minimise possible water pollution all the ravines were subsoil piped many years ago, the total length of subsoil pipes laid being 10,307 yards.

With the exception of ravine A, the waters from the ravines discharge directly into the reservoir through the subsoil pipe outlets.

Owing to the high water level maintained in the reservoir these subsoil pipe outlets are constantly under water. As there is insufficient cover of earth over the pipes in the lower reaches of the ravines, the land is now wet and soggy, and many potential breeding places have been created for dangerous mosquitoes. The only satisfactory solution to this problem is to raise the level of the ravine floors in the lower reaches by earth filling. This would be a considerable and costly undertaking, and the question is under consideration.

As an experiment a small concrete lagoon has been constructed in the ravine floor of ravine F into which the subsoil pipes now discharge. 15 fifteen-inch concrete inverts, and 50 revetment slabs were used in its construction.

Owing to the neglect in the up-keep of the ravines during the occupation period a number of subsoil pipelines were found to be grossly choked with roots thus impeding their function and resulting in water appearing on the ground surface. Work in progress.

Area No.63 Swiss Cottage No.1.

A number of "fox holes" had been made by cutting into the hill slopes, resulting in the appearance of a number of dangerous seepages. These were dealt with by laying a new line of six-inch subsoil pipes for a distance of 720 feet. The main concrete channel was repaired by relaying 25 twentyone-inch, 10 eighteen-inch and 2 twelve-inch concrete inverts.

Area No.67 Spottiswoode Park.

5 twentyone-inch concrete inverts and 140 revetment slabs were relaid.

Area No.68 Pearls Hill.

Due to activities on this land during the occupation the whole of the subsoil pipe system was damaged and put out of alignment. 1,061 feet of subsoil pipes were taken up and relaid, and the subsoil pipeline extended for a further 429 feet by laying six-inch subsoil pipes.

Area No.73 Mandalay Road.

10 twentyone-inch and 74 twelve-inch concrete inverts, 244 revetment slabs, and 5 four-inch subsoil pipes were relaid.

Area No.79 Serangoon Village.

50 twentyone-inch, 40 twelve-inch concrete inverts, 240 revetment slabs, 10 six-inch and 10 four-inch subsoil pipes were relaid.

Area No.81 Mount Rosie Ravine.

20 twentyone-inch, 174 eighteen-inch concrete inverts and 486 revetment slabs were relaid. Work in progress.

Area No.88 Jewish Cemetery Ravine.

6 eighteen-inch, 25 fifteen-inch, 15 twelve-inch and 4 nine-inch concrete inverts were relaid.

A.M. Area 89 Kampong Bahru (Silat Road).

As much of the land in the area was to be raised to provide a housing site under a Singapore Improvement Trust Scheme, the main concrete drain was no longer required. All serviceable inverts and slabs were removed.

When the filling is completed the question of drainage of the low ground behind it will have to be considered.

Area 91 Holland - Bukit Timah.

This large drain, which runs parallel to Farrer Road, was severely damaged during the war and the whole length of drain in the main ravine has to be relaid. 513 twentyone-inch, 10 nine-inch, concrete inverts, 877 revetment slabs and 21 six-inch subsoil pipes were relaid during the year.

A considerable area on either side of the main drain and in the subsidiary ravines had been used for vegetable cultivation during the occupation period. Cultivation having been abandoned, the area was badly overgrown with blukar. This was cleared and numerous ponds and pits were exposed which were filled. Subsidiary drains which had been "lost" under the heavy undergrowth were re-established. Work in progress.

Area 93 Bukit Timah Filters (Monk's Hill).

Several large ponds, constructed by the Japanese, to hold emergency water supply, were filled in, and a number of "fox holes" dealt with. Mechanical Earth Dumpers were used to carry the earth from the hill nearby to the pond sites. The drain was repaired by relaying 80 fifteen-inch and 11 nine-inch concrete inverts. One culvert was constructed.

Area 95 Nassim Road Ravine.

50 twentyone-inch concrete inverts and 430 revetment slabs were relaid.

Area No. 96 Western Reclamation.

15 fifteen-inch, 170 twelve-inch, 18 nine-inch concrete inverts, and 306 revetment slabs were relaid.

Area No. 97 Wee Avenue.

27 eighteen-inch, 80 fifteen-inch, 37 twelve-inch concrete inverts, and 660 revetment slabs were relaid.

Area No. 100 Adam Park Ravines.

In the ravines in this area a considerable length of the anti-malarial concrete drain was damaged during the war. 240 twentyone-inch, 787 eighteen-inch, 335 fifteen-inch, 45 twelve-inch concrete inverts, 2,625 revetment slabs, 80 six-inch and 40 four-inch subsoil pipes were relaid.

The ravine floors have been cleared of undergrowth. Work in progress.

Area 101 McPherson Road.

The outlet drain between Aljunied Road and the Kallang Basin was repaired. 126 twentyone-inch, 130 eighteen-inch, 20 twelve-inch concrete inverts and 1,070 revetment slabs were relaid.

Area 104 Katong.

The anti-malarial drain at the side of Ramsgate Road was repaired. 42 twelve-inch concrete inverts were relaid.

Area 106 Jalan Besar.

365 twelve-inch concrete inverts and 190 revetment slabs were relaid.

Area 107 Wayang Satu Ravines.

177 twentyone-inch, 606 eighteen-inch, 38 fifteen-inch, 12 twelve-inch concrete inverts, 3,998 revetment slabs, 12 six-inch and 5 four-inch subsoil pipes were relaid. Two washing places were constructed for the use of squatters in the ravines. Work in progress.

Area No. 109 Mount Pleasant Ravines.

275 twentyone-inch, 120 eighteen-inch, 135 twelve-inch, 45 nine-inch concrete inverts, 1,456 revetment slabs and 10 six-inch subsoil pipes were relaid.

Area No. 110 McRitchie Ravines.

207 twentyone-inch, 140 eighteen-inch, 60 fifteen-inch, 12 nine-inch concrete inverts, 1,090 revetment slabs and 124 six-inch subsoil pipes were relaid. The subsoil pipelines were extended by using 492 six-inch and 255 four-inch subsoil pipes.

Area No. 115 Alexandra Road Ravines.

The permanent works in Ravine No. 2 in this area have been severely damaged. The Japanese threw a bund across the ravine to provide an emergency water supply. On the reoccupation the ravine floor was used as a training ground for British troops - obstacles e.g. brick walls and barbed wire fences were erected and pits, which were kept permanently filled with water were dug.

424 twentyone-inch, 80 eighteen-inch, 102 fifteen-inch, 136 twelve-inch concrete inverts, 1,592 revetment slabs, 191 six-inch, 12 eight-inch and 319 four-inch subsoil pipes were relaid. The subsoil pipeline was extended by laying 117 six-inch subsoil pipes.

Area No.117 Telok Blangah Ravine.

94 twentyone-inch, 113 twelve-inch concrete inverts, 361 revetment slabs and 175 four-inch subsoil pipes were relaid.

Area No.121 Brick Factory Ravine.

428 twentyone-inch, 15 eighteen-inch, 25 twelve-inch concrete inverts, 2,032 revetment slabs, 90 six-inch and 510 four-inch subsoil pipes were relaid.

Area No.123 Kampong Limau Ravine.

5 fifteen-inch concrete inverts and 20 revetment slabs were relaid. The existing subsoil pipe line was extended by using 129 six-inch subsoil pipes.

Area No.124 Alexandra Cemetery Ravine.

30 twentyone-inch, 2 eighteen-inch, 40 fifteen-inch concrete inverts and 632 revetment slabs were relaid.

Area No.125 Faber Ridge Ravine.

15 twentyone-inch concrete inverts, 100 revetment slabs, and 10 six-inch subsoil pipes were relaid. Work in progress.

Area No.126 Temple Ravine.

Dangerous seepages outcropped at the head of this ravine behind the Magazines and at the back of the Cable Depot. They were dealt with by laying 378 six-inch and 40 four-inch subsoil pipes.

Area No.130 Mount Washington Ravine.

The activities of squatters in this ravine caused considerable damage to the permanent anti-malarial works. 88 twentyone-inch, 5 fifteen-inch, 6 twelve-inch concrete inverts and 503 revetment slabs were relaid. Work in progress.

Area No.133 Kallang Basin.

60 fifteen-inch, 200 twelve-inch, 35 nine-inch concrete inverts and 152 revetment slabs were relaid.

Area No.134 Bendemeer.

This A. sundaicus breeding area is low lying and the drainage is controlled by a tide gate. Oiling has always been necessary. The area is, at present, in a most unsatisfactory state due to indiscriminate dumping of refuse and disused metal thus, not only interfering with the drainage, but making it much more difficult to oil efficiently owing to difficulty of access.

15 eighteen-inch, 35 fifteen-inch, 40 twelve-inch, 20 nine-inch concrete inverts and 125 revetment slabs were relaid.

Area No.138 Ah Hood Ravine.

95 revetment slabs were relaid.

Area No.141 Thomson Road No.5 Ravine.

50 fifteen-inch, 52 twelve-inch concrete inverts and 257 revetment slabs were relaid.

Area No.144 Hindoo Cemetery Ravine No.1.

10 twentyone-inch, 30 eighteen-inch concrete inverts and 40 revetment slabs were relaid.

Area No.146 Mohammedan Cemetery Ravine.

6 twentyone-inch, 25 eighteen-inch, 15 twelve-inch concrete inverts and 86 revetment slabs were relaid. Dangerous outcropping seepages were trapped by laying 130 six-inch and 70 four-inch subsoil pipes.

Area No.147 Woodsdale Ravine.

45 eighteen-inch concrete inverts and 40 revetment slabs were relaid.

Area No.167 Carey Road Ravine.

15 eighteen-inch concrete inverts and 90 revetment slabs were relaid.

Area No.170 Braddell Road Ravine.

18 twentyone-inch, 73 eighteen-inch, 10 nine-inch concrete inverts, 450 revetment slabs and 10 six-inch subsoil pipes were relaid. The Municipal Engineer removed a Japanese Tank that had become embedded in one of the anti-malarial drains.

Area No.172 Wolskel Road Ravine.

50 twentyone-inch, 20 twelve-inch concrete inverts and 230 revetment slabs were relaid.

Area No.173 Beo Lane Ravine.

13 twelve-inch concrete inverts and 56 revetment slabs were relaid.

Area No.175 Bidadari Cemetery Ravine.

A. maculatus was found breeding in seepages behind the Roman Catholic Chapel and along the northern boundary of the Cemetery. The seepages were subsoiled piped, 1,080 six-inch and 118 four-inch pipes being used. The main anti-malarial channel was repaired by relaying 30 twentyone-inch concrete inverts and 40 revetment slabs.

Municipal Chemical Laboratory,
Singapore,
17th January '48.

The Municipal Health Officer,
Singapore.

Sir,

Report on the work of the Chemical Laboratory during the year 1947.

The number of samples received and analysed during the year amounted to 17,729.

The samples were received from -

Water Department	8,612
Sewerage Department	2,384
Health Department	96
Electrical Department	488
Gas Department	56
Engineering Department	6
Prevention of Cruelty to Animals Department	2
Commercial firms	6,085
	17,729

WATER DEPARTMENT.

The following samples were analysed -

Water from purification system, including tap supplies (8,429), miscellaneous water for special tests (112), lime (56), bleaching powder (1), fertilizer (1), water meters (7), lubricating oil (4), limestone (1), belt dressing (1).

Municipal Water Supply.

The sources of supply of raw water were the three reservoirs on Singapore Island viz. MacRitchie, Peirce and Seletar and three in Johore. About 55% of the total water used was supplied by the Island reservoirs. The average volume of water used daily was a little more than 51 million gallons, an increase of 50% on the consumption for 1937/38. This large increase has naturally put a strain on the present treatment capacity. At Pulai efficient chemical purification depends on firstly the addition of Chemicals to 'flocculate' the dissolved vegetable matter, iron etc., secondly the settling of this 'floc' in sedimentation tanks and finally filtration of the clarified water from the sedimentation tanks. Due to the serious overloading at Pulai the sedimentation tanks are not nearly large enough now to allow proper settlement of the 'floc' which consequently quickly chokes the filter beds. At the request of Mr. F.G. Hill many experiments, both in the laboratory and on a small works scale, were carried out to improve the type of 'floc' so that it would settle out much more quickly. The experiments are not yet concluded and large scale flocculation of the water supply was not done as in pre-war days. Fortunately the iron content of the raw water has never been high and the appearances of the tap water has not appreciably suffered.

All the waters were treated with chloramine and lime was added to give a slightly alkaline tap water. These tap water showed satisfactory physical and chemical characteristics. Where complaints arose it was often found that the sediment present came from the house water tanks.

The samples received daily for analyses were drawn from every part of the purification system. The averages and ranges of analyses of the various raw water are shown in TABLE A (at end of this report). TABLE B gives analyses of the water immediately before going into the supply pipes.

SEWERAGE DEPARTMENT.

The following samples were analysed -

Sewage and sewage sludge from the sewerage purification systems (2,122), sewage for special tests (151), sewage from small installations (55), stream samples (30), concrete pipes (8), glazed pipes (13), chemicals used in 'sani-lid' closets (2), sewerage main deposit (1), cement lining (2).

Sewage Purification.

There are three main purification plants viz. Alexandra Road, Kim Chuan Road and Serangoon. Water-borne Sewage from the sewered areas is purified either at Alexandra Road or Kim Chuan Road. The crude night soil from the un-sewered areas is emptied into a special sewerage system at People's Park, Albert Street or Paya Lebar Road from which places it is pumped to special tanks at Kim Chuan Road for preliminary treatment and to Serangoon tanks for final treatment. The solid matter separated from the water-borne sewage at Alexandra Road is also pumped to Kim Chuan Road to receive treatment in the night soil tanks. The final products of these plants are dried sludge at Serangoon and purified sewage effluents which flow (a) into the Alexandra Road stream from the Alexandra Road plant (b) into the Serangoon River from the Kim Chuan Road plant.

The qualities of these effluents are shown in the following tables, where the results are expressed as parts per 100,000.

	Into Alexandra Road Stream	
	Ranges	Averages
Free & saline ammonia	0.57/1.17	0.84
Albuminoid ammonia	0.10/0.39	0.21
Oxygen absorbed in 4 hours	0.69/1.08	0.89
Bio-chemical oxygen demand	0.91/3.12	2.24
Total solids	53.3/131.8	82.1
Suspended solids	1.6/2.4	2.03
Nitrates (as N)	0.20/0.57	0.37
Chlorides (as Cl)	13/60	32
PH value	7.4/7.8	7.5

	Into Serangoon River.	
	Ranges	Averages
Free & saline ammonia	0.84/3.50	1.97
Albuminoid ammonia	0.13/0.70	0.31
Oxygen absorbed in 4 hours	1.56/3.10	2.01
Bio-chemical oxygen demand	1.76/16.2	5.58
Total solids	48.8/90.8	70.4
Suspended solids	2.1/10.3	4.6
Nitrates (as N)	--	--
Chlorides (as Cl)	19/32	25
PH value	7.3/8.0	7.6

The results at Alexandra Road are very satisfactory in that the effluent contains extremely little solid matter in suspension and is fairly well oxidised. The results for December were the best and were easily below the standards accepted in England.

The effluent at Serangoon River from the Kim Chuan Road plant is not so good. At this plant, of course, there is no filtration as at Alexandra Road, and, moreover, the bio-flocculation unit was not working properly and was under repair for the latter months of the year. The results can be considered satisfactory as the effluent gets a reasonably high dilution in the Serangoon River. The quality should show a marked improvement in 1948, when the bio-flocculation unit is in full operation.

Sewage Effluents from Small Installations.

The samples submitted represent the final effluents emptying into open drains. The 55 samples analysed were taken from 48 installations and the annual averages and ranges of values, in parts per 100,000, were as follows:-

Parts per 100,000	Range	Average
Free & saline ammonia	0.08/3.84	1.32
Albuminoid ammonia	0.04/0.64	0.25
Oxygen absorbed in 4 hours	0.05/4.35	1.16
Suspended matter	0.2/9.2	3.15
Chlorides (as Cl)	1.0/11.2	3.7
Nitrates (as N)	0.0/2.2	0.71

Although these results are not so good as pre-war, they are surprisingly good when one realises the lack of maintenance etc. over the war years.

HEALTH DEPARTMENT.

The following samples were analysed -

Aerated waters (68), sherry (15), potatoes (2), fresh milk (2), milk product (1), reconstituted milk (1), chocolait (1), orange juice (1), sugar (1), rat poison (2), china clay (1), flour (1).

The aerated waters from factories and small 'fountains' were examined for metallic contamination, particularly lead. The sherries were also examined for metallic contamination but were found to be satisfactory. The potatoes represented large shipments and were examined for the possibility of solanine poisoning as they showed very considerable 'sprouting'.

The volume of work done on examination of foods and drugs is small due principally to the fact that world shortages involved the waïving of many regulations concerned with quality and labelling. The chief consideration was to safeguard the public against the use of contaminated supplies. Advice was given and analyses carried out of the various swimming pools on Singapore Island.

ELECTRICAL DEPARTMENT.

The following samples were analysed -

Fuel oil (122), transformer oil (5), boiler water (340), boiler sediment & scale (14), fire-bricks (2), corroded lead sheathing (1), water (1), switch oil (1), bitumens (2).

GAS DEPARTMENT.

The following samples were analysed -

Coal (24), coke (7), tar (2), oxide of iron for sulphur contents (23).

The specimens from the P. C. A. consisted of internal organs of a cow for toxicological analyses.

Samples received from Commercial Firms etc.

A total of 6,085 samples were reported on. They have been classified under the following headings viz.

Local products	1,134
Foods	225
Drugs etc.	482
Oils vegetable	2,006
Oils mineral	47
Oils essential	307
Alloys	185
Ores	1,424
Chemicals	57
Drinking water	25
Swimming pool water	63
Boiler feed water etc.	3
Coal	29
Coke	2
Specimens for sea-water	37
Miscellaneous	59
Total.	6,085

The types of samples received under these main classifications are as follows:-

Local products.

Tuba root, jelutong, rubber, soap, fibre, gutta percha, gutta katiow, soh, rubber coagulants, copra, fireclay, firebricks, latex, cutch, gambier, mangrove bark.

Foods.

Sago, pearl barley, macaroni, rice-bran, rice-flour, dhall, pepper, tea, codliver oil, ghee, margarine, milk, cream, condensed milk, sugar, salt, chocolate, bamboo shoots, aerated water, beer, wine, cider, plum water, sarsaparilla, syrup, vinegar, stout, lime-juice, pineapple juice, soya bean, vegetable-extract, nutmegs, agar-agar, confectionery, mustard oil.

Drugs etc.

Cinchona bark, quinine sulphate, totaquina, caster oil, M & B tablets, quinine, dill water, glycerine.

Vegetable oils.

Palm, coconut, groundnut, palm kernel, rubber seed oils.

Mineral oils.

Fuel oil, lubricating oil, turbine & transformer oils.

Essential oils.

Citronella, patchouli, cananga oils and patchouli leaf and vanilla beans.

Alloys.

Estimations of lead, tin, antimony, arsenic, copper, iron, carbon etc.

Ores.

Tungsten, tin, antimony, sulphur, lead, copper, iron, aluminium, chromium, manganese, rare earths etc.

Chemicals.

Many different types.

Specimens for sea-water damage.

Piece-goods, films, electrical equipment, rat-traps, carpet wrapping, gunny sacks, razor blades, cloth, shoes, iron hinges, rust, paper etc.

Miscellaneous.

Paint, paint-thinners, wax, tallow, filter powders, leather preservative, brilliantine, cosmetics, stamp pads, oils, cattle-bone powder, boot polish, lighter flints, spirits, brine, methyl phthalate, monoethanolamine, alcohol, ash, acetone, biscuit tins, race horse saliva and sweat, gypsum, lime.

I was in charge of the laboratory during the year and Mr. T. A. Spillane arrived in September to take up the duties of Deputy Analyst.

I have the honour to be,
Sir,
Your obedient servant,

Sgd. R.E. Willgress.
A.R.C.S.,B.Sc.,F.R.I.C.
MUNICIPAL ANALYST.

RESERVOIR WATERS

TABLE A

AVERAGES & RANGES OF ANALYSES FOR THE YEAR 1947.

PARTS PER MILLION	PONTIAN		PULAI		MacRITCHIE		PEIRCE		SELETAR	
	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE	AVERAGE	RANGE
Nitrites	Absent	-	Absent	-	Absent	-	Absent	-	Absent	-
Carbon dioxide	2.8	0.5/7.0	7.6	3.0/18.0	2.6	1.0/9.0	2.6	0.5/3.0	5.8	1.0/12.5
Alkalinity (as $CaCO_3$)	7.2	4.0/12.0	6.5	abs/12.0 below	4.1	2.0/8.0 below	3.3	abs/8.0 below	0.8 below	abs/16.0 below
PH value	6.4	5.5/6.9	5.8	5.2/6.6	5.7	5.2/6.4	5.6	5.2/6.3	5.2	5.2/6.7
Iron	0.70	0.3/1.40	0.65	0.3/2.4	0.6	0.3/1.0	0.6	0.3/0.9	0.75	0.2/1.40
Colour in 2 ft-tintometer:										
Yellow	5.5	3.2/10.9	5.6	2.5/23.0	6.4	3.7/17.5	5.7	3.2/12.5	6.6	3.2/11.3
Red	0.9	0.3/3.4	1.1	0.3/5.7	1.4	0.5/7.0	1.1	0.3/4.8	1.4	0.6/4.8
Blue	0.8	0.5/3.0	0.7	0.3/4.0	1.2	0.5/5.0	1.0	0.5/3.5	0.9	0.4/4.3

Note: The water from Seletar Reservoir showed an average free chlorine content of 0.07 (range from abs/0.35).

TABLE B

PURIFIED WATERS

AVERAGES AND RANGES OF ANALYSES FOR THE YEAR 1947.

PARTS PER MILLION	PULAI CLEAR WATER TANK AVERAGE	PULAI CLEAR WATER TANK RANGE	BUKIT TIMAH CLEAR WATER TANK AVERAGE	BUKIT TIMAH CLEAR WATER TANK RANGE	WOODLEIGH CLEAR WATER TANK AVERAGE	WOODLEIGH CLEAR WATER TANK RANGE
Nitrites	Absent	-	Absent	-	Absent	-
Carbon dioxide	1.5	abs/11.0	0.6	abs/5.5	0.4	abs/3.5
Alkalinity (as $CaCO_3$)	14.5	3.0/116.0	10.0	abs/30.0	19.5	2.0/44.0
PH value	8.0	5.4/9.6 above	8.3	5.2/9.6 below above	8.5	6.8/9.6 above
Iron	0.35	0.05/1.10	0.45	0.20/0.80	0.30	0.05/1.00
Colour in 2 ft-tintometer:						
Yellow	2.8	0.6/7.0	5.1	2.7/12.5	1.8	0.6/5.0
Red	0.4	0.0/1.0	1.0	0.1/5.9	0.2	0.0/0.8
Blue	0.6	0.3/1.0	1.0	0.5/3.5	0.5	0.3/0.8

MUNICIPAL BACTERIOLOGICAL LABORATORY,
MUNICIPALITY,
SINGAPORE.

9th February, 1948.

To.
THE MUNICIPAL HEALTH OFFICER,
SINGAPORE.

SIR,

I have the honour to report on the work done in this department during the year 1947.

A. PUBLIC HEALTH SPECIMENS

The total number of specimens received including rats and fleas was 26,241 and involved 31,895 examinations. This number was made up as follows:-

Specimens from Municipal Health Office	4,932
" " Lady Medical Officer	680
" " Middleton Hospital	3,308
" " Kwong Wai Siew Hospital	16
" " Johore Water Works	415
" " European Practitioners	6,925
" " Eurasian "	1,181
" " Chinese "	1,210
" " Malay "	41
" " Indian "	978
Total rats examined ...	3,578
" fleas " ...	2,977
GRAND TOTAL	26,241

Figures from the annual reports for the years 1939, 1940, 1941 and 1946 are quoted for comparison to the above.

Year 1939	=	Total number of specimens	= 27,131
" 1940	=	" " " "	= 27,143
" 1941	=	" " " "	= 26,960
" 1946	=	" " " "	= 18,467

1. MALARIA.

Species	POSITIVE	NEGATIVE	TOTAL
P. falciparum	114		
P. vivax	301		
P. malariae	-		
Mixed Infection (B.T. & S.T.)	1		
NEGATIVE		4,473	
GRAND TOTAL.	416	4,473	4,889

Source	POSITIVE	NEGATIVE	TOTAL
FROM - Medical Practitioners	242	1,749	1,991
Municipal Health Office	116	2,387	2,503
Johore Water Works	58	337	395
GRAND TOTAL.	416	4,473	4,889

The number of positive bloodfilms was 8.5%

In the year 1939 it was 19.1%
" " " 1940 " " 30.7%
" " " 1941 " " 20.2%
" " " 1946 " " 19.6%

The number of positive bloodfilms from Johore Water Works was 17.2% compared with 50.6% in 1946.

2. TUBERCULOSIS.

SOURCE	POSITIVE	NEGATIVE	TOTAL
Sputum	432	3,346	3,778
Urine	1	6	7
Throat swabs	2	2	4
Cerebro-spinal fluid		5	5
Pus		1	1
Pus (from Cow)		3	3
Glands (from Horse)		1	1
Glands (from Bullock)	1		1
Lung (" ")	1		1
Milk		7	7
C.S.F. (from Dog)		1	1
GRAND TOTAL.	437	3,372	3,809

There was an increase of 1,725 specimens of sputum examined this year over last year.

3. ENTERIC FEVER.

	POSITIVE	NEGATIVE	TOTAL
Blood for Widal Reaction:			
Agglutination with Eb. typhi	39	159	198
" " B. para A.	2	172	174
" " B. para B.		174	174
" " B. para C.		174	174
Blood clot culture - B. typhosus isolated	6	165	171
Faeces culture - B. typhosus isolated	16	314	330
Urine " "	16	306	322
Faeces " (from Dog)		2	2
Hog's intestines (Salted casing)		1	1
GRAND TOTAL.	79	1,467	1,546

4. TROPICAL TYPHUS - Weil-Felix Reaction.

Number of sera positive for Proteus OXK = 5
" " " " " Proteus OX19 = 1
" " " investigated = 68

5. DYSENTERY.

AMOEBIC	POSITIVE	NEGATIVE	TOTAL
E. histolytica	188		188
E. coli	50		50
Others (from Dog)		9	9
NEGATIVE		3,617	3,617
TOTAL.	238	3,626	3,864
BACILLARY			
B. dysenteriae - Flexner	21		21
" " Shiga	-		-
" " Sonne	-		-
" " Schmitz (2 positive stools from Dogs)	5		5
OTHERS (from Dog)		6	6
NEGATIVE		576	576
TOTAL.	26	582	608
GRAND TOTAL.	264	4,208	4,472

6. CHOLERA.

Four stool specimens were examined, all of which were negative.

7. PLAGUE.

No human specimens were received.

Rats - 3,578 rats were dissected and none showed any signs of plague infection. The species and distribution are given below.

SOURCE	R. Decumanus.		R. Rattus		R. Concolor.		R. Musculus		Crocidura	Total Pregnant.	TOTAL		Total Rats
	M.	F.	M.	F.	M.	F.	M.	F.			Mite	Fleas	
Town Area	1048	1578	468	277	55	46	22	14	31	126	13	2975	3539
38 Indian Field Hygiene Section.	5	4	2	2	-	-	-	-	-	1	-	2	13
Port Area	-	1	5	5	-	-	5	9	1	-	-	-	26
	1053	1583	475	284	55	46	27	23	32				
GRAND TOTAL	2636		759		101		50		32	127	13	2977	3578
Total Pregnant		92		28		6		1		127			

Of the total number of rats examined, 32 were received dead. All the 26 rats from the Port area were dead rats. It was reported that they were gassed with HCN gas.

Fleas - 2977 fleas were caught making a flea index of 83. The flea index in the town (Municipal) area was 84. All the fleas were identified as X. Cheopis.

8. CEREBRO-SPINAL FEVER.

10 specimens of cerebro-spinal fluid were examined and the meningococcus was demonstrated in 4. One cerebro-spinal fluid was from a dog and was negative.

9. ACUTE ANTERIOR POLIOMYELITIS.

One specimen of cerebro-spinal fluid from a suspected case of Infantile paralysis was received for estimation of the cell count, total proteins and chlorides.

10. LEPROSY.

Skin smears - positive	=	27
NEGATIVE	=	23
Total	=	50

11. DIPHTHERIA.

SPECIMEN	POSITIVE	NEGATIVE	TOTAL
Throat swabs	332	1,450	1,782
Eye swab		1	1
Virulence tests	1		1
GRAND TOTAL.	333	1,451	1,784

As in previous years, the number of positive throat swabs do not represent cases of diphtheria. They include repeated examinations done to control the discharge of patients from Middleton Hospital.

12. BRUCELLOSIS.

1. Blood for Agglutination test B. Abortus	7 negative.
2. Pus from cow for culture - B. Abortus	4 negative.
Total.	11 Negative.

13. SMALLPOX.

During the year, skin scrapings were taken from the rash of 15 cases of smallpox, and examined by the method described by Van Rooyen. The elementary bodies were demonstrated in 8 early cases, in the papular and vesicular stages. In all, between the epidemic period of May 1946 to March 1947, skin-scrapings from 51 cases of smallpox were examined, and the results showed that the positive smears with elementary bodies corresponded with the cases in the papular and vesicular stages and the negative smears in the pustular stage where the presence of pus and secondary infection masked the picture of the smears. For its rapidity and simplicity, this method has proved useful as an aid in the diagnosis of Smallpox.

14. MISCELLANEOUS EXAMINATIONS.

	POSITIVE	NEGATIVE	TOTAL
Urine for General Examination			1,354
Pathological Exudates for General Examination.			71
Pus for Gonococci	102	355	457
Urine " "	2	24	26
Prostatic Smear for Gonococci	1	7	8
Serum for Treponema pallida	29	53	82
Seminal fluid for Spermatozoa	8		8
Blood for Differential count			89
" " Kahn Reaction	444	1,170	1,614
" " Culture			10
" " Haemoglobin Estimation			4
Sputum for Pneumococcus	1		1
Throat swab for Pneumococcus	21		21
Sputum for H. pertussis		1	1
Urine for Filaria		1	1
Blood-film for Filaria		6	6
" " piroplasmosis (from Dog)		1	1
Urine for Leptospirosis (from Dog)		2	2
Animal organs from Municipal Veterinary Surgeon			6
Tinned Sardines			2
Canned Pineapple			1
Orange Juice Cordial			1
Chutney (preserved mangoes)			1
Brewery Yeasts for viability			1
Baker's " " "			3
Beer			2
Disinfectants			14
MILK - Fresh			89
Evaporated - (canned)			39
Dry powdered			2
Cream			1
Ice-cream			4
Lecithin Food			3
Oesophagus from Buffalo for B. sacocystis	1		1
Scab for isolated of B.necrophorus (from cow's foot)		1	1
Pus from cow for Actinomyces		4	4
Organs from Chicken for culture - B. pullorum		3	3
Salted Hog's casing for Food-poisoning group.		1	1
Faeces for Food-poisoning group (from Dog)		2	2
" " " "		2	2
" " Occulat Blood	1	8	9
" " Intestinal parasites:			
Ankylostome (Dog - 4)	116		
Ascaris	1,063		
Trichuris (Dog - 2)	95		
Oxyuris	2		
Strongyloides (Dog - 1)	21		
Lamblia cysts	44		
Trichomonas	1		
Cerconomas	3		
OTHERS (Dog - 2)		3,403	4,748
GRAND TOTAL.			8,696

Guineapig Inoculations:	POSITIVE	NEGATIVE	TOTAL.
For M. Tuberculosis - Pus from Cow	-	2	2
" Diphtheria - Virulence Test	1	-	1
" Leptospirosis - Urine from Dog	-	2	2
TOTAL.	1	4	5

B. WATER.

Seven thousand five hundred and twenty-four routine samples from the Municipal Water supply were tested bacteriologically. This figure exceeded the total number analysed in 1946 by 2951 samples.

The examination consisted of (1) the determination of the total number of colonies per m.l. developing on Nutrient agar at 37°C. in 24 hours and (2) an estimation of the probable number of coli-form organisms in 100 m.l. of the water and calculating the probable number by the McCrady and Swaroop's tables.

The year's average results are shown below:-

SOURCE	Year's average Total colonies per m.l. at 37°C. in 24 hours.	Year's average B. coli count per 100 m.l.
MacRitchie Valve Tower	298	15
Peirce Valve Tower	227	10
Seletar Suction Channel	167	14
Bukit Timah Clear Water Tank	21	Nil.
Woodleigh Clear Water Tank	52	Less than 1
Gunong Pulai Clear Water Tank	25	Nil.
Pearl's Hill Tank No.1.	71	Less than 1
" " " No.2.	97	" " 1
Fort Canning Reservoir	70	" " 1
Tap - Laboratory (Coleman Street)	73	" " 1
Lorong Lalat	66	" " 1
Joo Chiat	60	" " 1
Havelock Road	99	" " 1
Average of 4 taps	75	" " 1
Halesworth	29	" " 1
Pontian Valve Tower	306	15
Pontian Clear Water Tank	125	1

Condition of tap water taken from various points of the town continued to be satisfactory throughout the year.

From 1st June 1947, with the appointment of a new laboratory assistant, the department was able to perform daily examinations of routine water samples throughout the year inclusive of Sundays and Holidays.

Five hundred and two miscellaneous water samples were examined during the year. They were from the following sources:-

1.	Naval Hygiene Department	38
2.	Royal Naval Volunteer Reserve	22
3.	Assistant Director of Medical Services (Army)	68
4.	Singapore Swimming Club	260
5.	Tanglin Club Swimming Pool	66
6.	Others	48
	TOTAL.	502

One sample of Ice block was received from the A.D.M.S. (Army) for Bacteriological examination in June and found to be satisfactory.

In December, complaints were again received from the Geylang and Katong Districts of red worms from the tap supply. These worms were found to be Midgo Larvae (Genus Chironomidae). At the time of this report, investigations are still being carried out to trace the source and the breeding grounds of these larvae, so as to evolve a method to eradicate them.

ALGAE - Ninety-one samples of water were examined for algae count. No abnormal increase of any one type of algae was noted during the year.

C. SEWERAGE.

Thirty-three samples of wash-water from the Conservancy department were examined to check the efficiency of the disinfectants used at the pumping stations and nightsoil collection depots and found to be satisfactory.

Ten samples of sewerage effluent and thirty specimens of sun-dried humus were received from the Sewerage Engineer, for ova and larvae of Ankylostome and Ascaris. No infective larvae were found from all the samples.

D. STAFF.

Mr. Tan Teck Meng joined the laboratory on 1st June 1947.

Remarks - I wish to record my appreciation of the co-operation and good work done by the laboratory staff during the year.

I have the honour to be,
Sir,
Your obedient servant,

Sgd. Ng See Yook.

MUNICIPAL BACTERIOLOGIST.

Infant Welfare Department,

Singapore, 23rd January, 1948.

To The Municipal Health Officer,
Municipality.

Sir,

Subject: ANNUAL REPORT 1947.

I have the honour to submit my report on the activities of the Midwives and Infant Welfare Department during the year 1947.

STAFF. For the greater part of the year, the Infant Welfare Department were carrying on as best we could with a shortage of staff.

DOCTORS. Dr. Thora Oehlers joined the service in February 1947 as 2nd Asst: Lady Medical Officer.

Dr. Mary Tan the Lady Medical Officer left for 1 year's well earned vacation leave in March and Dr. Maggie Lim 1st Asst: Lady Medical Officer has been acting in her place. Doctors Lim and Oehlers have been running the 3 Clinics between them, and attending poor sick mothers in their own homes.

SISTERS. Sister Stephens has been doing the work of Superintendent of Midwives. The post of Infant Welfare Sister was vacant till mid June when Miss J. Horrocks, ScM.,SRN., qualified Health Visitor arrived from England to fill the post. She has been doing very useful work checking on the work of both Staff Nurses and Health Visitors by going out health visiting with them. She has also been giving them a course of Public Health lectures and in every way giving instruction and help to the nurses. Separate Ante Natal Sessions have been organised again by her, whereas without her extra presence, we had perforce to see ante natal mothers on the same days as the infant clinic sessions. The increasing number of Ante Natal mothers attending testify to the usefulness of the work being done.

NURSES. The full pre-war complement of Health Visitors was not made up till November 1st and it was quite impossible to keep up to date with the Health visiting schedule and run the Clinics properly at the same time, with the increasing numbers of well and sick babies daily attending at all 3 Clinics. We were 5 below pre-war numbers in the early part of the year, and there were many sick leaves to make the numbers even more depleted. 1 Health Visitor was invalided out after being away on all the sick leave available to her prior to being invalided out. 1 Health Visitor resigned.

MIDWIVES. The 4 Midwives have been working really hard. They were on call 24 hours out of 24, with only 1 day a week off duty. Their work was not only to deliver cases and also to attend for washings during the puerperium - but they also had to take over Post natal case of self delivered poor cases and those delivered by private midwives whose services, perforce, had to be discontinued on the grounds of economy. It has not been possible to grant the services of our midwives to every applicant as the bookings far exceed the possible capacity per midwife.

TRANSPORT. 3 Staff Nurses on duty in outlying districts were transported on their rounds by means of 2 yellow top taxis and 1 truck for the first few months. As from April 1 Municipal car replaced 1 yelow top, and later in June, 3 brand new Austin cars were then used, 1 of them allotted to Sister Horrocks for duty purposes.

CLINIC WORK Since after the war, the nature of the "infant consultations" given at the Clinics have altered somewhat. Previously, our chief concern was with the upbringing of the well baby, giving advice on mothercraft, feeding, and clothing, with, occasionally, treatment of simple ailments. Nowadays, with the non-reopening of St. Andrew's Hospital resulting in the congestion in the Out-patient Departments and Wards in Hospital, poor mothers unable to afford the services of Private Doctors, bring their sick babies to the Infant Welfare Clinics.

Thus, altho it is not really within our province, we have in 1947, continued the added responsibility of undertaking the curative treatment of infants as well as advising on the care of the normal baby. There has been some difficulty in obtaining medicines and equipment and we have overworked the services of the Municipal Dispenser but I think barring factors beyond our control, we have done our very best to do our share in keeping down the infant mortality rate.

We had perforce to stop seeing toddlers up to 3 years, concentrating our efforts on the infants up to 1 year, On account of the congestion in the clinics, the shortage of staff and difficulties with medicine supplies. But children over 1 year old who are not thriving are allowed to continue to attend for consultation and to draw supplies of powdered milk if necessary, also Cod Liver Oil and Vitamin products.

1. Infant Clinics

	1947	1946 (9 months)
New Babies taken on the 3 Clinic Registers for the purpose of home visiting	23,257	13,527
Percentage of Total Births Registered	75.82%	66.58%
Consultations at the 3 Clinics	54,158	18,021
Vaccination at the 3 Clinics	23,065	21,641
2. Toddlers Clinics		
Children 1 - 3 years	2,493	2,006
Consultations	4,557	4,852
3. Ante Natal Work		
Ante Natal Mothers attending the 3 Clinics	1,723	1,152
Consultations	4,023	2,289
4. Post Natal Work		
Post Natal Mothers attending the 3 Clinics	1,385	874
Consultations	3,056	1,549

	1947	1946 (9 months)
5. Free Milk Feeding (Government Child Feeding Scheme)		
Number of lbs of Powdered Milk issued	20,614	10,800
Number of issues	36,574 (Babies)	172,623 (Feeds)
6. Health Visiting		
Visits paid in the Districts by Health Visitors	68,265	27,089

Babies are visited 4 times in their first year of life.

1. 21st day 2. $2\frac{1}{2}$ months

3. 6 months 4. 1 year

IMMUNISATION AGAINST DIPHTHERIA

	1947	1946
1st injections given to children between 1-6 years	10,152	3,613
2nd injections given to children between 1-6 years	8,565	1,981
Total injections altogether	18,717	5,594
Visits paid to homes advising immunisation	16,198	3,841
Cases refused inoculation	208	85

In November, inoculation against Diphtheria and Whooping Cough using combined A.P.T. and Anti Pertussis vaccine was started on selected cases who appeared co-operative. Experience with mass A.P.T. Immunisation showed there was always difficulty in getting cases to return for their 2nd injections, thus wasting the time and vaccine expended in giving the 1 injection. Therefore with the combined A.P.T. and Pertussis work, only those with mothers who appeared eager to have the injections were inoculated:-

1st injection	...	42
2nd injection	...	12
3rd injection	...	2

PANEL DOCTORS FOR POOR CASES

11 Panel Cases were treated:

1 Dr. Van Cuylenberg
1 Dr. Loh Poon Lip
1 Dr. Menon
2 Dr. Ong Swee Law
6 Dr. Shankor

10 Torn Perineum stitched Lady Medical Officers.

7 Dr. Maggie Lim
3 Dr. Oehlers.

INSPECTION OF MIDWIVES

2,168 Private Midwife attendances were registered at the 3 Clinics for the inspection of their bags and books.

93 24 Hours Report books were sold at $2/- each realising the sum of $186/-.

26 Case Books were sold at $2/- each realising the sum of $52/-.

After June, it was decided to issue these books free of charge.

63 24 Hours Report Books were then issued free of charge.

30 Case Books were then issued free of charge.

MUNICIPAL MIDWIVES

1,131 Free confinements for poor cases in their own homes were conducted by the 4 Municipal Midwives.

7,003 Visits paid to their homes by the 4 Municipal Midwives.

SUPERVISION OF MIDWIVES

	1947	1946
Total Births reported at Registrar of Births and Deaths.	30,672	26,859
Of these:-		
Twins are	187 pairs	119 pairs
Triplets	2 sets	-
No. of visits paid by Staff Nurses to homes shortly after delivery ...	24,912	18,226
No. of mothers seen by Staff Nurses in their homes ...	23,029 (75.55%)	15,443 (79.38%)
No. of newly born babies seen by Staff Nurses in their homes ...	22,463 (75.23%)	15,020 (77.29%)
No. of Still Births registered ...	584	547
No. of Neonatal Deaths ...	870	127
Total confinements reported ...	30,481	-
Of these No. delivered in Hospital were	6,779 (22.24%)	3,224
" " No. delivered by Private Doctors	1,485 (4.54%)	796
" " No. delivered by Registered Midwives ...	16,481 (54.37%)	10,476
" " No. self delivered ...	5,736 (18.85%)	4,965
Maternal Deaths Registered ...	80	103
Puerperal Sepsis Cases reported ...	25	21
Tetanus Neonatorum Cases reported ...	77	60

Sgd. M. Lim
Ag. Lady Medical Officer i/c.
Municipal Infant Welfare Clinics.

MIDDLETON HOSPITAL,
SINGAPORE.

3rd February, 1948.

To.
THE MUNICIPAL HEALTH OFFICER,
SINGAPORE.

Sir,

I have the honour to submit the annual report of the Middleton Hospital for the year 1947.

Table I below shows the number of admissions, discharges and deaths during the year.

TABLE I.

	Remaining 31.1.46.	Admitted	Discharged	Died	Remaining 31.12.47
Small-pox.	17	41	47	11	-
Cholera	-	-	-	-	-
Plague	-	-	-	-	-
Chicken-pox.	7	323	308	-	22
Measles & Rubella	1	103	104	-	-
Diphtheria	11	154	126	23	16
Cerebro-spinal Fever	1	15	14	2	-
Erysipelas	-	2	2	-	-
Scarlet Fever	-	-	-	-	-
Whooping Cough	1	12	12	1	-
Mumps	5	191	195	-	1
Acute Anterior Poliomyelitis	-	-	-	-	-
Enteric Fever	1	59	46	6	8
Tropical Typhus	-	1	1	-	-
? Typhoid Carriers	-	85	85	-	-
Amoebic Dysentery	7	89	93	2	1
Bacillary Dysentery	-	5	4	1	-
Clinical Dysentery	-	6	5	1	-
Observation & Contacts	6	119	124	-	1
Other Diseases	2	184	169	15	2
TOTAL.	59	1389	1335	62	51

Dangerous Infectious Diseases:

Cholera: No case.
Plague: No case.
Smallpox: The epidemic of Smallpox that started in May 1946 continued during January and February of the year under review. There was only one admission in March. Of the 41 cases admitted 11 died.

Enteric Fever: 57 cases of Typhoid and 2 cases of Para-Typhoid "A" were admitted during the year. Six deaths were recorded, all from intestinal haemorrhage. 4 cases were treated with Penicillin and Sulphathiozole, with no appreciable effect on the clinical course of the disease.

Tropical Typhus: One case of Scrub Typhus was admitted.

Dysenteries: 89 cases of Amoebic Dysentery and 5 cases of Bacillary dysentery were admitted, with two and one deaths respectively.

Diphtheria: 154 cases of Diphtheria were admitted into the hospital. With 11 cases remaining from the previous year, 165 cases were treated during the year. Of these admissions, 38 cases required immediate Trachyotomy. Many were already in extremis when admitted, showing that parents are still slow to realise the serious nature of this disease.

23 cases died during the year, a crude death rate of 14%. Of the 23 deaths, 9 died within an hour of admission and 8 within 24 hours. If these were excluded, the corrected death rate will be 3.9%. Of the 38 Trachyotomies, 6 died, a mortality of 16%.

TABLE II

Type of cases		Admitted	Died
Laryngeal & Tracheal	...	63	14
Nasopharyngeal	...	19	7
Faucial	...	51	2
Nasal	...	3	-
Contact-Carriers	...	18	-
TOTAL	...	154	23

TABLE III

Nationality		Admitted	Died
European	...	4	-
Eurasian	...	3	-
Chinese	...	137	23
Indian	...	7	-
Malay	...	2	-
Jews	...	1	-
TOTAL	...	154	23

Admissions by Age-Groups with deaths.

TABLE IV

Age	Admissions.	Deaths
Under 1 year	14	5
1 - 5 years	96	18
5 - 10 years	26	-
10 - 15 years	6	-
15 - 20 years	2	-
Above 20 years	10	-
TOTAL	154	23

Cerebro-Spinal Fever: 15 cases of cerebro-spinal fever were admitted during the year. Two died, one dying within 12 hours of admission and the other on the third day.

Mumps: This is not a notifiable disease, but 191 cases were admitted during the year. Most of the cases were from Thompson Road Police Depot where there was an outbreak amongst fresh recruits.

Other Diseases: 184 persons admitted to the hospital as suffering from one or other of the infectious diseases, were found not to be so but from other causes. Of these, 15 died, cause of death being Brocho-Pneumonia 4, Encephalitis 2, Beriberi 4, Pulmonary Tuberculosis 2, Cellulitis of the neck 1, Subtertian Malaria 1, and Senility & Terminal Diarrhoea 1. The others were either discharged or transferred to other hospitals.

TABLE V. Nationality & Number of Hospital Days.

Nationality	Remaining from 1946		Admitted - 1947	
	Number	Days in Hosp.	Number	Days in Hosp.
European	3	11	94	810
Eurasian	2	25	48	476
Indian	17	150	295	2779
Chinese	34	317	696	6894
Malay	3	50	255	1863
Jews	-	-	1	31
	59	553	1389	12853

Daily Average Number of Patients in Hospital = 36.7

Average Number of Hospital Days per Patient = 9.25

Number of Patients admitted from outside Municipal Limits. = 234.

Number of Service Personal and their Dependants admitted. = 72.

TABLE VI. Admissions for the last 10 years.

Diseases.	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946
Plague	-	-	-	-	-	-	-	-	-	-
Cholera	-	-	-	-	-	-	-	-	-	-
Smallpox	-	2	1	1	1	-	-	-	1	99
Chickenpox	709	695	763	789	369	279	801	251	100	256
Measles & Rubella	78	161	140	204	51	21	124	21	11	211
Diphtheria	170	192	269	284	300	194	144	122	78	140
Cerebro-Spinal Fever	15	20	17	21	23	8	-	22	6	6
Erysipelas	1	4	2	2	1	2	-	2	1	-
Scarlet Fever	-	1	1	4	1	-	-	-	-	-
Whooping Cough	1	1	3	2	7	3	9	-	-	34
Mumps	206	187	133	33	137	11	5	9	18	42
Acute Anterior Poliomyelitis	-	-	-	-	2	-	-	-	-	137
Enteric Fever	-	238	-	-	27	76	211	215	95	74
Tropical Typhus	-	-	-	-	-	1	5	1	1	3
Amoebic Dysentery	-	-	-	-	-	165	177	252	140	95
Bacillary Dysentery	-	-	-	-	-	1282	194	247	193	15
Clinical Dysentery	-	-	-	-	-	-	29	2573	1538	48
Observation and Contacts	82	365	99	115	311	306	280	857	433	69
Other Diseases	62	50	80	98	119	694	735	1433	454	471
TOTAL.	1324	1916	1508	1553	1349	3042	2714	6005	3069	1701

Staff: Dr. H.R. Morrison went on home leave in April 1947, since when the present writer was in charge as acting Medical Superintendent.

In conclusion, I wish to thank Professor Ransome for his advice as consultant, and to members of the Staff for their loyal service and co-operation.

I have the honour to be,
Sir,
Your obedient servant,

Sgd. Ng Bee Yook,
ACTING MEDICAL SUPERINTENDENT.

Municipal Health Office,
Markets,
Singapore,

15th January, 1948.

The Municipal Health Officer,
Singapore.

Sir,

Annual Report 1947.

I have the honour to submit the 25th Annual Report on the Markets of Singapore, their repair and upkeep and the inspection of foodstuffs exposed for sale in them as well as in the town generally.

Municipal Markets.

There are nine Municipal Markets. No new market has been built during the period under review.

Private Markets.

There are six Private Markets within the Municipal Limits. Private Markets are subject to the Municipal Ordinance and Market Byelaws. The licensees are mainly responsible for the administration of these markets.

Cleansing.

Routine work has been satisfactorily carried out by the Market labourers. The usual yearly cleansing on Chinese New Year's Eve was not carried out as there was a general strike which lasted from the 21st of January to the 16th of February. All market labourers were absent for this period and Japanese surrendered personnel were used.

Repairs.

Minor Maintenance and repairs were carried out by the Architects, Engineers, Electric, Gas, Sewerage, Plumbers Stores and Water Departments throughout the year on departmental indents.

Clyde Terrace. The Municipal Engineer's Department repaired the boundary drains in January, February and April and the extension of the Auction Yard in January. In December the cracks in the open surface drains on the east side of the fish section were attended to.

The Municipal Architect's Department repaired damaged fish slabs in January, February and 13 meat stalls in March. In April, 11 meat stalls were re-covered with new aluminium sheetings, and in June all skylights along the front bay were fitted with new panes (inclusive of Meat, Dry Goods and Wholesale Vegetable Sections). In October work commenced on the renovation of the corrugated iron gutters in the Fish Section and Auction Yard and this was completed in November.

The Municipal Electric Department, in March, installed new electric wiring in the Fish Section Auction Yard and market office and replaced and repaired wires that were out of commission since the Japanese Occupation period.

Ellenborough. The Municipal Engineer's Department in November commenced preliminary work on the re-levelling of the concrete drain along Fish Street and this was completed in December.

The Plumbers Stores in January attended to 3 water taps in the Hawkers' Shelter, in September fixed a new water tap in the Auction Yard and in December renewed 2 salt water stop-cocks as well as fixed 1 new water pipe in the Vegetable Section.

Orchard Road. The Municipal Architect's Department recommenced the fixing of actinic glass sheets to the windows on the 28th February 1947 and in July attended to repairs of portion of the floor. Leaks in the roof over the Vegetable Section were attended to in November.

The Plumbers Stores attended to the central guttering and rain water down pipes in the Vegetable Section in April, repaired the rain water pipes as well as the eaves gutters in July and December and renewed 8 gully trap lids in September and 22 in November.

Teluk Ayer. The Municipal Architect's Department renovated 3 concrete stalls in January, attended to 23 Dry Vegetable Stalls in March and April and repaired the broken iron fencing in November and December.

Kandang Kerbau. The Municipal Architect's Department removed the collapsible iron gates to the River Valley Road stores for repairs in March and completed in December.

The Gas Engineer's Department attended to all gas lights in April.

Peoples' Park. The Municipal Architect's Department attended to all roof leaks in February.

The Plumbers Stores repaired and refixed the leaking salt water underground pipes in February and repaired the broken water pipe adjoining the Vegetable Section and Fish Section respectively in March and June.

Maxwell Road. The Municipal Architect's Department repaired 6 meat stalls and covered same with new aluminium sheetings in July. The masons reconstructed the concrete drain in the Pork Section as well as repaired broken portions of the floor premises in June and completed the floor in August.

Sims Avenue. The Municipal Architect's Department installed 31 new Changhai wooden stalls in February.

The Electrical Engineer's Department renewed the electrical wiring of the whole market in October.

Grange Road. The Municipal Engineer's Department repaired the road entrance of the main gate in November.

Unsound Foodstuffs (Markets).

1,441 lbs. of assorted provisions, 1,600 heads of poultry, 7,930 eggs and 130,969 katties (approximately 78 tons) of unsound foodstuffs were collected from all markets and sent to the Municipal Incinerator for destruction.

Prices and Quantities of Foodstuffs.

The quantities of foodstuffs passing through the 7 principal markets as well as their estimated values were recorded.

The Price Controller introduced and fixed Control Prices for certain foodstuffs and rigorous steps were taken by the Food Controller to prevent profiteering and black-marketing. Price Inspectors were in

daily attendance from January to 4th September. Official announcement of de-control of fish and vegetables took effect from 5th September 1947 onwards. Price tagging was introduced on all commodities following decontrol of prices of fish and vegetables. Prices although comparatively very much higher than prewar, shewed a general decrease over 1946, as can be gauged from the following table of comparative prices:-

(Table A).

Article	Per	1940	1941	1942	1945 B.M.A.	1946	1947
Beef	Kati	.40	.45	.48	3.20	1.50	1.50
Mutton	lb.	.39	.65	.65	-	.75	.75
Pork	Kati	.49	.60	.60	3.10	3.00	2.34
Tea	lb.	1.09	1,50	1.50	2.00	1.70	1.50
Coffee	Kati	.15	-	-	.85	.60	.70
Sugar	Kati	.07¾	.07½	.08½	.10	.20	.25
Salt	Kati	.02¼	.02½	.02¾	.05	.06	.08
Potatoes	Kati	.08	.10	.10	-	.30	.29
Yam	Kati	.07	.09	.09	.15	.17	.17
Ducks	-	5.92 (Doz.)	.30 (ktty)	.30 (ktty)	3.40 (ktty)	3.98 (ktty)	1.44 (ktty)
Eggs (hens)	-	.37 (Doz.)	.42 (ten)	.42 (ten)	.38 (each)	1.80 (ten)	1.65 (ten)
Capons	Kati	.60	.75	.75	-	4.05	2.88
Fowls	Each	.57 (1½ ktts)	.85 (1½ ktts)	.90 (1½ ktts)	3.50 (ktty)	3.30 (ktty)	1.94 (ktty)
Rice	Gantang	.32½	.60	.60	.48	.96	1.50

Revenue (Table B).

Market	1940	1941	1.1. to 15.2.42	1945 B.M.A.	1946	1947
Clyde Terrace	130,531.19	145,003.85	2,857.00	67,403.18	345,100.44	206,648.74
Ellenborough	91,674.39	94,553.37	3,213.00	82,626.24	442,071.87	246,473.66
Telok Ayer	18,210.50	18,032.00	1,536.00	1,349.00	17,639.50	32,819.00
Orchard Rd.	15,523.00	15,494.50	1,376.00	947.50	13,194.50	30,422.00
Kandang Kerbau	20,811.50	21,094.00	2,318.00	1,242.50	18,318.50	34,883.00
Grange Rd.	1,812.00	2,020.00	-	129.50	1,716.00	3,780.00
Sims Avenue	3,626.00	3,645.00	258.00	678.40	3,769.00	9,528.00
Maxwell Rd.	12,088.50	12,307.00	1,023.00	735.50	8,900.00	18,828.00
Peoples' Park	10,682.00	10,822.00	1,336.00	687.00	8,945.50	17,104.00
Total	304,959.08	322,971.72	13,917.00	155,798.82	859,655.31	600,486.40

Slab and stall rents were increased from 1st January by various percentages over the prewar rates

5% Commission on Fresh Fish Auction Sales.

(Table C).

	1940	1941	1942	1945 B.M.A.	1946	1947
Clyde Terrace	90,332.19	105,757.35	-	65,017.18	307,585.94	136,179.74
Ellenborough	54,102.39	56,770.87	-	80,965.24	406,229.87	175,020.66
Telok Ayer	-	-	-	-	-	-
	144,434.58	162,528.22	-	145,982.42	713,815.81	311,200.40

Revenue for the 5% Commission on wet fish auction sales decreased by $171,406.20 in Clyde Terrace and $231,209.21 in Ellenborough Market; a total decrease of approximately 56.4% over the 1946 figures. The decrease was partly due to the prevailing decrease in prices of fish.

Quantity of Fish Landed, Auction Value & 5% Commission.

(Table D).

Market	Period	Quantity landed and Auctioned.	Total Auction Value	Total 5% Commission collected
		Katties	$	$
Ellenborough	(Nov. & Dec.) 1945	1,830,365½	1,619,276.12½	80,965.24
Clyde Terrace	(Nov. & Dec.) 1945	1,002,373½	1,300,343.60	65,017.18
Ellenborough	1946	18,401,681	8,124,597.40	406,229.87
Clyde Terrace	1946	12,237,577	6,151,718.80	307,585.94
Ellenborough	1947	5,724,560	3,500,413.20	175,020.66
Clyde Terrace	1947	5,208,806	2,723,594.80	136,179.74

Returns.

Daily. To the Director of Fisheries, giving total weight of fish auctioned in Clyde Terrace and Ellenborough Markets, the amount of and the place of origin of the fish auctioned. To the Food Controller giving average wholesale prices of fish sold at auction.

Monthly. Average Market Price Lists to the Registrar of Statistics, Singapore, the Singapore Traction Co., Ltd. and the Controller of Labour, Singapore.

Staff.

The following changes in staff were made:-

Mr. Lim Joo Siang, a temporary clerk and auctioneer and 2 market labourers were medically boarded out as unfit for further service and the two market labourers were repatriated. 1 Senior labourer retired and 5

Senior labourers were reverted to labourers.

Two clerks and auctioneers Messrs. Yuen Tuck Weng and Liu Chin Siong were confirmed in their appointments. Mr. Quek Meng Cheng was appointed a temporary clerk and auctioneer.

In December Senior labourer P. Suppiah returned from leave and resumed duty on 1.12.47.

85 attendances were recorded at the Municipal Dispensary by the Staff and labourers of the market during the year.

Leave.

Vacation leave was granted to the following:-

Name.	Appointment.	Period.
Mr. Goh Lye Choon	Manager, Ellenborough	6 months
" Teo Kah Phua	" Clyde Terrace	1 month
" Chan Kian Guan	Clerk & Auctioneer	3 months
" Quek Huang Pheow	do.	2 weeks
" Seah Kwang Meng	do.	1 month
" R. Retnam	Overseer, Peoples Park	6 months

3 watchmen were granted leave to proceed to India. "Gantis" were appointed in their places. 2 Senior labourers and 15 labourers were granted no pay leave to proceed to India.

Town.

281.63 tons of Onions, Potatoes and Carrots, 1.556 tons, 43 cases, 40,335 tins and 136 bottles of assorted provisions, 1.425 tons of Yeast as well as 7 barrels of salted fish were collected from civilian stores and the Singapore Harbour Board premises and destroyed as unfit for human consumption.

General.

In January Mr. Teo Kah Phua, Manager of Clyde Terrace Market in addition to his own duties, was appointed to act for Mr. Goh Lye Choon the Manager of Ellenborough Market, who was granted 6 months vacation leave commencing on the 24th of January.

During the period of the General Strike (21st January - 15th February inclusive) when the labourers stayed away from work the cleansing and removal of refuse was done by Japanese Surrendered Personnel as well as by the stall-holders themselves. Market stall-holders looked after the markets at night when our watchmen stayed away from work. The labourers and watchmen resumed duty on the 16th of February.

In February, 31 new stalls (16 Dry Goods and 15 Vegetables) were installed in Sims Avenue Market.

In March six new meat stalls (4 beef and 2 mutton) were installed in Orchard Road Market.

In April three new meat stalls (1 beef and 2 mutton) were installed in Kandang Kerbau Market.

April 14th being Hindu New Year, all market labourers had a holiday.

Notices prohibiting bicycles and other vehicles inside the markets were posted up on the 24th of June.

On August 15th the labourers observed Indian Independence Day.

October 20th - "HARTAL DAY" - All Municipal Markets remained opened throughout the day, but no business was done by the stall-holders. The majority of market labourers ceased work on that day. There were no Wholesale Fish Auction sales in both Clyde Terrace and Ellenborough Markets respectively and all the six private markets were closed on that day.

I attach returns showing the approximate amount of foodstuffs passing through the markets with their approximate values, the quantity of unsound foodstuffs destroyed and a summary of vacant stalls as on 31st December 1947.

I have the honour to be,
Sir,
Your obedient servant,

Sgd. Koh Cheng Khiang,
Cert. R. San. Inst.
MARKET INSPECTOR.

RETURN OF SOME OF THE FOODSTUFFS PASSING THROUGH THE MARKETS.
FOR THE YEAR 1947.

MARKET	FISH				MEAT			VEGETABLES & FRUITS				POULTRY		PROVI-SIONS	MISCEL-LANEOUS	APPROXI-MATE VALUE.
	Fresh	Shell	Boiled	Salted	Beef	Mutton	Pork	Fresh	Dry	Salted	Fruits	Live-stock	Eggs			
	Katis	Katis	Katis	Katis	Katis	Lbs.	Kts.	Katis	Katis	Katis	Katis	Heads	Tens	Lbs.	Katis	$
Clyde Terrace	1047100	193500	-	758300	758300	214600	224500	4281500	793200	176100	420800	68870	170435	24420	150700	5.65500
Ellenborough	1479497	649679	425426	1734897	15410	-	707502	1469476	946333	52378	10064	48830	124742	53531	18563	5821896
Telok Ayer	117652	-	15025	11475	96690	53995	297527	1500097	1986840	10951	745770	26795	16455	37772	106960	2112192
Kandang Kerbau	497780	58368	14080	41735	240260	189693	326220	1103200	3900	2940	91750	99100	147270	34585	76610	2672120
Orchard Road	419844	10476	42151	5215	412612	36884	280003	323013	5262	16474	402362	39618	166346	77014	23224	2426608
Peoples' Park	24940	-	-	-	-	-	70394	46768	-	1360	-	53232	-	420	3590	324620
Maxwell	289806	16950	-	20418	150340	94867	208400	813390	5500	20200	900	109800	19245	-	16385	1892939
Grange Road																
Sims Avenue																
TOTAL.	3876619	928773	496682	2572040	1673612	590039	2114346	9537444	3741035	280403	1671646	446245	644493	227742	404032	21155771

Date 15th January 1948.

Sgd. Koh Cheng Khiang.
MARKET INSPECTOR.

UNSOUND FOODSTUFFS DESTROYED FOR THE YEAR 1947.

MARKET	FISH				MEAT			Vegetables	Fruits	POULTRY		PROVISIONS				Yeast	Misc.
	Fresh	Shell	Boiled	Salted	Beef	Mutton	Pork			Live-stock	Eggs	Cases	Tins	Bottles	lbs.		
	Katis	Katis	Katis	Katis	Kts.	Lbs.	Katis	Katis	Katis	Heads	Tens	Nos.	Nos.	Nos.		Katis	Katis
Clyde Terrace	15145	2090		915	1695			18590	4530	614	454				140		
Ellenborough	15274	115						12940	1323	133	71				155		11300
Telok Ayer								9366	1425	40							951
Kandang Kerbau	278	2093		27				3288	2082	36	7						106
Orchard Road	375	2574			291			4421	8181	196	105				1109		1657
Peoples' Park	46							711		381							113
Maxwell	335	510			185			1968		200	143						703
Grange Road	192							586	356						23		364
Sims Avenue	499	225						2005	542		13				14		597
Total Markets	32144	7607		942	2171			53875	18439	1600	793				1441		15791
Total Town				7 barrels				281.63 tons				43	40335	136	1.556 tons	1.425 tons	

Date 15th January, 1948.

Sgd. Koh Cheng Khiang.
MARKET INSPECTOR.

SUMMARY OF VACANT SLABS AND STALLS AS ON 31ST DECEMBER 1947.

DESCRIPTION	CLYDE TERRACE	ELLEN-BOROUGH	TELOK AYER	KANDANG KERBAU	ORCHARD ROAD	PEOPLE'S PARK	MAXWELL	GRANGE ROAD	SIMS AVENUE	REMARKS
FISH	32	13	10	1	4	9	25	5		
MEAT: (a) Beef	2					1		1		
(b) Mutton										
(c) Pork						2		1	2	
VEGETABLES:										
(a) Fresh	18	4	12				39	1	1	
(b) Salted						2	1			
(c) Dry			1							
(d) Dry & Salted										
POULTRY:										
Livestock	10	8	2			1	11	1	4	
Eggs						1	1			
DRY-GOODS						2	5	1	4	
MISCELLANEOUS:										
Beancake					4		7			
Hawkers										
Dressed Duck							2			
Moneychanger										
Currystuff					1	1				
HAWKERS, EATING - LARGE										
ICEBLOCK										
SODA FOUNTAIN										
PROVISION										
TOTAL.	62	25	25	1	9	19	91	10	11	

Date 15th January 1948.

Sgd. Koh Cheng Khiang,
MARKET INSPECTOR.

Municipal Abattoirs,
French Road,
Singapore.
6th January, 1948.

The Municipal Health Officer,
Singapore.

Sir,

I have the honour to submit my report for the year ending 31st December, 1947.

During the year 282,459 animals were slaughtered in the Municipal Abattoirs, 222,778 were swine, 2,608 oxen, 4,322 buffaloes, 1 horse, 51,712 sheep and 1,038 goats.

108 swine died in the pens.
134 swine died in the depot.
26 swine carcases were totally condemned, Pyrexia accounting for 22, Swine Fever 2, Septicaemia 1 and Septic Peritonitis 1.

I have the honour to be,
Sir,
Your obedient servant,

Sgd. J. L. da Silva.

	Swine	Oxen	Buffaloes.	Horses	Sheep	Goats
Admitted for slaughter 1947	222,717	2,598	4,293	4	51,639	1,040
Slaughtered 1947	222,778	2,608	4,322	1	51,712	1,038
Died in pens	108	-	3	-	64	2
Died in depot	134	-	-	-	-	-
Carcases (complete) condemned	26	-	2	-	26	1
Diseased organs etc. cond. & dest. in lbs.	3,191½	1,072¾	3,188	-	4,039¼	103

Fees for slaughter at Sheep Section	$52,679.00
" " " " Cattle "	20,685.00
" " " " Pig "	445,434.00
" " storage at French Road Depot	12,120.90
Receipts as penrents (all slaughter houses)	34,009.40
Inspection fees for pig and wild boar carcases	76.00
Receipts for sale of blood	140.30
Total receipts for the year 1947	$565,144.30
Total receipts for 1.4.46 to 31.12.46	$105,674.04

Special slaughtering licenses issued during the year 1947 (2 swine = $40.00, 6 sheep = $60.00 and 4 goats = $40.00) $140.00

Animals Slaughtered Monthly In Municipal Abattoirs During THE YEAR 1947.

	Swine	Oxen	Buffaloes	Horses	Sheep	Goats
January	22,948	140	472	-	4,232	31
February	16,982	124	467	1	4,177	12
March	18,437	200	369	-	5,011	12
April	17,803	38	471	-	3,489	11
May	18,508	132	416	-	3,721	85
June	19,275	133	403	-	4,551	52
July	18,883	296	369	-	3,512	25
August	19,397	402	315	-	5,508	135
September	17,584	317	276	-	3,427	70
October	18,268	284	312	-	4,155	54
November	17,805	332	218	-	4,993	517
December	16,888	210	234	-	4,936	34
Total slaughtered during 1947	222,778	2,608	4,322	1	51,712	1,038
Total slaughtered during 1.4.46 to 31.12.46	159,615	2,191	4,028	74	22,677	147

Carcases Totally Condemned During The Year 1947.

	Swine	Oxen	Buffaloes	Sheep	Goats
Bruising, extensive and severe	-	-	-	1	-
Cas. Lymphadenitis	-	-	-	1	-
Dropsy	-	-	-	-	1
Emaciation c Odema	-	-	1	1	-
Jaundice	-	-	-	5	-
Moribund	-	-	1	-	-
Septic Peritonitis	1	-	-	-	-
Pneumonia, gangrenous	-	-	-	1	-
Pyrexia	22	-	-	16	-
Septicaemia	1	-	-	1	-
Swine Fever	2	-	-	-	-
Total Condemned During 1947	26	-	2	26	1
Total Condemned During 1.4.46 to 31.12.46	1	2	1	15	-

RETURN OF LICENCES ISSUED UNDER THE FOOD SHOP BY-LAWS. DURING THE YEAR 1947.

NATURE OF LICENCE		Per Annum $	Number Issued	Cash Received $	DETAILS OF LICENCES ISSUED											
					For 1 Year	For 1 Month	For 2 Months	For 3 Months	For 4 Months	For 5 Months	For 6 Months	For 7 Months	For 8 Months	For 9 Months	For 10 Months	For 11 Months
	Ice Popsicles Factory	48	1	16					1							
BAKERIES	(Bakery	48	27	1,260	25						1			1		
	(Biscuit Factory	48	5	240	5											
	(Cake Shop	48	41	1,936	40				1							
	Syrup Making Shops	48	2	84	1									1		
BUTCHERS SHOPS, ETC.	(Meat Shop	48	75	3,540	73		1					1				
	(Fish Shop	48	1	48	1											
	(Mutton Shop	48	1	48	1											
	(Beef Shop	48	1	48	1											
	(Pork Shop	48	23	1,104	23											
	Ice Cream Factory	48	1	48	1											
EATING HOUSES, ETC.	(Eating House	48	1003	47,308	971	3	3	3	5	2	4	2	4	3	3	
	(Coffee Shop	48	177	8,172	167	1	2	2	2	1	1			1		
	(Iced Water & Cold Drinks	48	79	3,664	74	1			2					1	1	
	(Soda Fountain	48	46	2,088	42		1	1		1			1			
	(Food Caterer	48	1	48	1											
	Confectionery Shop	48	1	48	1											
	Aerated Water Factory	48	9	432	9											
	Margarine Factory	48	1	48	1											
	Milk Sellers	12	71	852	71											
	Sweets Making Shops	48	6	248	5		1									
	Dairy Shop	48	3	144	3											
	Food Shop	48	21	940	18			1			1				1	
	Fruit Drinks Factory	48	1	48	1											
	TOTAL		1597	72,412	1535	5	8	7	11	4	7	3	5	7	5	

Sgd. J.B. McMorine.
for CHIEF SANITARY INSPECTOR.

RETURN OF LICENCES ISSUED UNDER THE OFFENSIVE TRADE BY-LAWS

DURING THE YEAR 1947.

NATURE OF LICENCE	Per Annum $	Number Issued	Cash Received $	DETAILS OF LICENCES ISSUED		
				For 1 Year.	For 6 months	For 7 months
Blachan Store	36	3	108	3		
Brick Kiln	75	2	150	2		
Charcoal Making	--	-	-	-		
Dye House	18	6	108	6		
Drying and Sorting Fish	54	1	27		1	
Fruit Preserving	75	2	150	2		
Importation of Meat	75	1	75	1		
Laundry	12	268	3,216	268		
Private Market	600	6	3,600	6		
Sago Factory	75	2	150	2		
Sick Receiving House	1	3	3	3		
Soap Boiling	18	7	126	7		
Sugar Boiling	75	1	75	1		
Tannery	75	4	300	4		
Ammonia Re-packing	18	1	18	1		
CATTLESHEDS, PONYSTABLES, COWSHEDS:						
9 Animals and Under per head @	1.50	2	15	2		
10 - 14 Animals	15	1	15	1		
15 - 24 "	-	-	-	-		
25 - 50 "	-	-	-	-		
Over 50 "	75	2	150	2		
Vinegar Factory	18	1	18	1		
TOTAL.		313	8,304	312	1	

Sgd. J.B. McMorine.
for CHIEF SANITARY INSPECTOR.

RETURN OF NOTICES SERVED AND COMPLIED WITH ETC., DURING THE YEAR 1947.

NATURE OF NOTICES	Brought forward from last year	Served during the year	T o t a l	Complied with during the year	Carried forward to next year	REMARKS
Limewash Notice	16	29	45	39	6	
Latrine Notice	-	-	-	-	-	
Intimation Notice	91	46	137	117	20	
Drain Notice	-	-	-	-	-	
Well Notice	-	-	-	-	-	
Nuisance Notice	-	1	1	1	-	
Anti Mosquito Notice	-	16	16	16	-	
Demolition Notice	-	-	-	-	-	
Abatement Order	-	-	-	-	-	
Mandatory Order	-	-	-	-	-	
	107	92	199	173	26	

Sgd. J.B. McMorine,
for CHIEF SANITARY INSPECTOR.

HEALTH DEPARTMENT.

RETURN OF PROSECUTIONS FOR YEAR 1947.

OFFENCES	TOTAL					REMARKS
	Prosecutions	Withdrawn	Not Served	Convictions	Fines	
MUNICIPAL ORDINANCE						
Establishing a private market Section 198	2	-	-	2	$75	
Unlicensed Offensive Trades Section 211	27	-	8	19	670	
Filthy premises Section 233	2	-	-	2	60	
Non-compliance with Nuisance Notice Section 246	1	-	-	1	1	
Breaches of Offensive Trades Byelaws	1	-	-	1	5	
BYELAWS-SECTIONS 58 & 211 M.O.						
Unlicensed Foodshops	206	15	17	174	3,816.50	
Keeping swine in premises without Licence	5	1	-	4	35	
Breaches of the Foodshop Byelaws	20	1	-	19	205	
MARKETS AND SLAUGHTER HOUSES						
Market Byelaws	20	-	-	20	305	
SALE OF FOOD AND DRUGS ORDINANCE						
Selling Adulterated Milk Section II-I	1	-	1	-	-	
O. and P. DISEASE ORDINANCE						
Failing to report case of Inf. Disease Section 3	22	2	1	19	1,300	
Failing to have child vaccinated Section 43-I	104	2	4	98	868	1 case cautioned and discharged without costs.
Giving information as true when she knew it to be false Section 3	1	1	-	-	-	
REGISTRATION BIRTHS AND DEATHS ORDINANCE						
Wilfully furnishing false information re the birth of a child Section 25-I	1	1	-	-	-	

SUMMARY.

Total Inspections	30885
" Prosecutions	413
" Withdrawn	23
" Not Served	31
" Convictions	359
" Fines	$7,340.50

Sgd. J.B. McMorine,
for CHIEF SANITARY INSPECTOR.